

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

TO THE

DX ADVISORY COMMITTEE

OF THE

AMERICAN RELAY LEAGUE

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Submitted By

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TABLE OF CONTENTS

TITLE	PAGE
Statement of Purpose	1
Abstract	1
The Applicants	4
Acknowledgements and References	5
A History and Description of Jarvis Island	6
Amateur Radio Activity on Jarvis Island	9
Research	10
0 Introduction	11
1 Geographical introduction	11
2 Application of Point 3B	13
2.1 General Discussion	14
2.2 Border of sovereign territory	15
2.2.1 Border around Jarvis Island and Palmyra Atoll	15
2.2.1.1 United States sovereignty	15
2.2.1.2 General Status of Jarvis Island and Palmyra Atoll	15
2.2.1.3 Delineation of borders by the United States	16
2.2.2 Borders around eastern Kiribati	17
2.2.2.1 Republic of Kiribati Sovereignty	17
Figure 1 (MAP of Pacific Sovereign Territories)	17a
2.2.2.2 General status of Kiritimati, Tabuaeran, and Teraina	18
2.2.2.3 Delineation of borders by the Republic of Kiribati	18
2.2.2.4 Evaluation of border with Jarvis Island	19
2.2.2.5 Evaluation of border with Palmyra Atoll	20
2.2.3 Border and sovereign territory summary	20
2.3 Path between Jarvis and Palmyra	21
2.4 Comparison to other known applications of Point 3B	22
2.4.1 Kure Island	22
2.4.1.1 Status of DXCC countries criteria	23
2.4.1.2 Geography for Kure Island	24
2.4.1.3 Discussion	24
2.4.2 Market Reef	26
2.4.2.1 Status of DXCC countries criteria	26
2.4.2.2 Geography for Market Reef	27
2.4.2.3 Discussion	27
2.5 Are there any other probable Point 3 island DXCC countries?	29
2.5.1 Navassa Island	29
2.5.2 Tromelin Island	29
2.5.3 Europa, Bassa da India, and Juan de Nova	30
2.5.4 Glorieuses Islands	30
2.5.5 Discussion	31
2.6 Other observations	31
2.6.1 Question 1	31
2.6.2 Question 2	31
2.7 Final remarks on applying Point 3B to qualify Jarvis	33

STATEMENT of PURPOSE

The authors submit the following information as application to the American Radio Relay League (ARRL) for removing Jarvis Island from the Palmyra/Jarvis listing and to list Jarvis Island as a separate country to the DXCC Countries List.

ABSTRACT

Jarvis Island, located 0° 23' S. 160° 01' W. meets existing criteria for listing as a separate DXCC country. Separate country status is based on the following:

1. Point 3(b). SEPARATION BY ANOTHER DXCC COUNTRY:

The September, 1990, ARRL DXCC Countries List, Point 3(b) reads as follows:

"(b) Islands: Where two islands, of the government under Point 1, are totally separated by an intervening DXCC country (also under Point 1), *each* island counts as a separate DXCC country. No minimum distance is required. The test for total separation means that a straight line cannot be drawn from any point on one island to any point on the other island without passing through another DXCC country.

This intervening country may be part of either island, another island, or part of a continent.

The nearest country to Jarvis Island is the island nation, Kiribati. The territory created as a part of agreements between Kiribati and the United States of America, Parent country to Jarvis Island under rule 2 (b), interferes with the straight line that can be drawn between Palmyra Atoll (part of the existing island grouping country definition of Palmyra, Jarvis) and Jarvis Island. The closest U.S. land is Palmyra Island. However, in compliance with rule 3 (b) no straight line can be drawn between Jarvis and Palmyra without crossing the sovereign territory of Kiribati (as defined under the Maritime Zones Declaration Act of 1983, May 13). Kiribati territory also lies between Jarvis and Baker Island. These territories have been recognized by the United States (under provisions of Presidential Proclamation Number 5030, 1983, March 10). Also in compliance with rule 2 (b), Jarvis Island lies more than 500 miles from Howland, Wake and Johnston Islands. In fact no line can be drawn from Jarvis Island to any other US land without either crossing internationally recognized sovereign territory of other nations, or covering distances of more than 500 miles. The above application of rule 3 (b) is consistent with each of two other cases to date where rule 3 has been applied to

islands: Market Reef (OJØ) and Kure Island (KH7). For example, straight lines from Kure Island to neighboring parts of Hawaii pass nearby (but not exactly over) Midway Island. The ocean territory surrounding the DXCC country of Midway intervenes. Other examples where Rule 3 has been applied include: Juan de Nova (FR7/J), East Pakistan (now known as Bangladesh S2), Glorioso (FR7/G), Kaliningrad (UA2), St. Paul (CYØ), Cyprus (ZC4), Mauritania (5T), Malyj Vysotskij Island (4J1), and most recently Walvis Bay (ZS9). Decision on Penguin Islands (ZS1) is expected soon.

Since **no baseline for territorial rights definition exists in the DXCC Criteria**, it can only be concluded that applicable laws and **agreements between two countries are more likely to define the true territorial boundaries of island nations**. This then leads to the conclusion that the agreement between the countries influencing the territorial baseline definition for Jarvis Island was established in 1983 with the agreement referenced above.

2. Point 1, GOVERNMENT:

To further identify the territorial rights created by agreement between countries, Point 1 (d) refers to regulations of foreign trade and commerce, to wit:

"Point 1, GOVERNMENT

"An independent country or nation-state having *sovereignty* (that is, a body politic or society united together, occupying a definite territory and having a definite population, politically organized and controlled under one exclusive regime, and engaging in foreign relations - including the capacity to carry out obligations of international law and applicable international agreements) constitutes a separate DXCC country by reason of **Government**.....

".....the following characteristics are taken into consideration:

a).....

d) **Regulation of foreign trade and commerce, customs, immigration, and licensing (including landing and operating permits)**, and issuance of currency and stamps.

Jarvis, along with Howland and Baker Islands, are administered directly by the U.S. Fish and Wildlife Service. These three islands are not part of any state, commonwealth, or U.S. Trust territory. These areas are wildlife refuges. Entry to these islands is strictly forbidden unless special permission has been obtained from the U.S. Fish and Wildlife Service. The intervening country, Kiribati, extends its territorial rights 200 miles from a shore baseline of any of its islands. Palmyra, on the other hand, is part of the City and County of Honolulu, Hawaii (On December 12, 1939, in U.S. District Court, the United States Government contended that it is holder of the absolute fee and ownership of all the islets of the group making up Palmyra, and is entitled to the immediate possession thereof). Pacific island nations

currently are governing of these rights and respecting these territories as a result of formation of the Pacific Basin Development Council.^(A)

3. ERRORS in prior DXCC listings:

Jarvis Island was occupied by American citizens, including radio amateurs, just prior to the outbreak of hostilities in the Pacific during the 30's. During this period, Jarvis Island was considered part of an island grouping with Howland, Baker, and Canton Islands. Palmyra Atoll, on the other hand, was grouped with the Hawaiian Islands and considered as part of the grouping for the application of the Hawaiian Islands for statehood. Amateurs in post WWII activity from Palmyra and Jarvis Islands did not make application for separate status. Although Palmyra Atoll is administered by the U.S. Department of the Interior, the U.S. Fish & Wildlife Service has absolutely no jurisdiction over this Atoll and has never made claim to such jurisdiction.^(B) Whereas, since 1974 Jarvis Island, is tightly controlled by the U.S. Fish & Wildlife Service. This distinction is clearly an example of "separate administration" which was in effect in the DXCC rules at the time Jarvis Island was declared a U.S. National Wildlife Refuge. This oversight is brought to the attention of the DXAC at this time such that recognition of Jarvis Island as separate country can be dated back to the 1974 time period. To follow this line of reasoning, it must be pointed out that precedents have been established in prior listings through maintaining special instances of separate administration on the current DXCC list. Examples of such obvious retained countries include, Kingman Reef, Midway Island, and Desecheo. To delete these countries might attract the attention to other questionable retainees, such as Wales, Scotland, Guernsey, Jersey, Northern Ireland, and the Isle of Man - all DXCC countries under the United Kingdom, England being the parent country and thus requiring to meet separation criteria based on mileage from the parent country. One need only to glance at virtually any good atlas to discover the anomaly.

(A) The *Star-Bulletin & Advisor* January 14, 1990, Honolulu, Hawaii

(B) Based on review of documents on Johnston Island with Mr. Doug Forsell, Administrator for Pacific U.S. Wildlife Refuges.

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The above group was gathered as a result of research starting in early 1989 by AH3C. The concept of splitting Jarvis Island away from Palmyra Island is not new. This was previously discussed in a prior DXCC application by Eric Scace calling for drastic changes in DXCC rules. Our objective with Jarvis Island was to identify within existing criteria if at all possible. We all understand that our objective is based on interpretation of existing rules to bring about a clearer understanding of criteria in the DXCC community. The concept of "area of influence" is a means for understanding existing criteria such that any two geographically and/or politically separated bodies of land may be defined as separate countries if not otherwise already defined.

ACKNOWLEDGEMENTS and REFERENCES

W6CF, Jim Maxwell - for his assistance in understanding DXCC rules, and for his generous hospitality in providing access to his library and wealth of information.

The Bernice P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii - for historical information about Jarvis Island.

The Star-Bulletin & Advertiser. Honolulu, Hawaii - for information regarding commerce and other regional issues pertaining to the Pacific Islands.

The *Panala'au Memoirs*, by E. H. Bryan, Jr., Copyright 1974, published by the Bernice P. Bishop Museum, Honolulu, Hawaii, 96818.

AD1S, George Adkins and WØRLX, Burt Meyer - for information on their DXpedition and details about Jarvis Island.

KH6AY, Manny Pirez - for his personal insight into operating amateur radio from Jarvis Island during his stay as a "colonist" in 1938.

MAP - "The New Pacific", published in 1982 by the State of Hawaii Department of Planning and Economic Development.

MAP - "Pacific Island Nations and their 200 mile Exclusive Economic Zones", Published in 1989 jointly by the State of Hawaii Department of Planning and Economic Development plus the Pacific Basin Development Council.

A HISTORY and DESCRIPTION OF JARVIS ISLAND

Jarvis Island is an island of sand and coral formation, situated about 202 miles SW of Kiritimati Atoll and 22 miles south of the Equator in the Line Islands group. It is a low, saucer shaped coral island measuring 1 3/4 miles long in a E and W direction and about 1 mile wide in greatest width. Its area is 1,024 acres, about 1.6 square miles. The highest point on the island (23 feet) is on the northwest side. A narrow fringing reef, which dries in places, and has breakers along the S shore, encircle the island. There are two breaks in the reef on the W side. The central portion of the island is depressed practically to sea level, in part the result of guano digging. A shoal with a least known depth of 4.6m (15 ft.) extends about 1,200 yards from the E side of the island. The depths drop rapidly outside the shoal area.

Jarvis island is said to have been first discovered by Captain Brown of the ship *Eliza Francis*, August 21, 1821, he having returned to it with Captain Lock, April 30, 1822.^(C) But the island has also been called Jervis, Bunker, Volunteer, and Brook or Brock, some of which names appear on charts prior to 1821. Captain Michael Baker landed on it in the *Braganza* in 1835, 1836, and in in the *Desdamona* in 1845. The "Bunker island" in Alexander Adams' list more nearly agrees in position with Howland than with Jarvis. Jarvis was surveyed by the *Peacock* and *Flying Fish*, of the U.S. Exploring Expedition, in December, 1840.

It is stated that guano samples were taken in 1855. In March 1857, Alfred G. Benson, of New York, and Charles H. Judd, of Honolulu, landed from the Hawaiian schooner *Liholiho* (Captain John Paty) and claimed the island for the American Guano Company, under the Guano Act of 1856. A few months later the U.S.S. *St. Mary's* under Commander Charles Henry Davis, surveyed the island and made formal claim in the name of the United States.

February 27, 1858, C. H. Judd took 23 Hawaiian work men to Jarvis on the ship *John Marshall*, Captain Pendleton, to commence digging operations. Buildings were erected and moorings laid. From 1858 to 1879 there is a continuous record of guano shipments from the island, making it one of the most extensively exploited of the guano islands. On July 26, 1879, the American Schooner *Jos. Woolley*, under Captain Benj. Hampstead, "took all the men and material on board" and sailed in turn to Baker and Howland, where the guano works of these islands were also closed.

^(C) *The Panala'au Memoirs*, by E. H. Bryan, Jr., Copyright 1974, Pacific Scientific Information Center, Bernice P. Museum, Honolulu, Hawaii.

On June 3, 1889, the island was annexed by Great Britain. In 1906 it was leased to the Pacific Phosphate Company of London and Melbourne, but very little, if any, digging was done.

On August 30, 1913, the barkentine *Amaranth* of San Francisco, C. W. Nielson, master, with a cargo of coal from Newcastle, New South Wales, for San Francisco, stranded on the south shore of Jarvis.

In 1924 a scientific party from Bernice P. Bishop Museum visited Jarvis on the USS *Whippoorwill* and made a biological survey of the island. At that time Dr. Chester K. Wentworth made a careful contour map of the island, now preserved in Bishop Museum.

On March 26, 1935, "colonists" landed and the American flag once more was raised over Jarvis. These Hawaiian boys were routinely visited by supply ships and rotation of personnel until the outbreak of hostilities during World War II.^(D) Proclamation by President Roosevelt, May 13, 1936, transferred the jurisdiction of Jarvis Island to the Division of Territories of the U.S. Department of the Interior. In July, 1936, Richard B. Black arrived in Honolulu as representative in charge.

Four remaining colonists who were on the island from August 2, 1941 to February 9, 1942 recalled a visit of a submarine to the island. Thinking it belonged to the United States Navy, they rushed down the beach waving their arms. The submarine unlimbered its deck gun and commenced to fire upon the completely defenseless unarmed "colonists". Fortunately, owing to poor marksmanship, no one was hurt. The "colonists" scattered and ran, hiding on the island.

From July 1, 1957 to December 31, 1958, Jarvis was visited by a party of oceanographers, representing the Scripps Institution of Oceanography, during the International Geophysical Year.

Jarvis Island was later visited by members of "POBSP" (Pacific Ocean Biological Survey Program) under the auspices of the Smithsonian Institution. Rats had formerly occurred on Jarvis and the settlers had brought cats. The cats exterminated the rats and began feeding on the sea birds. POSB personnel killed over 200 cats in 1964 and 1965, and in later visits in 1967 and 1968 eight or nine were seen in a day or two.

Jarvis Island is now firmly a United States possession, and in 1974 was declared a National Wildlife refuge and was placed under the jurisdiction of the Fish and Wildlife Service. Visits by the U.S. Fish & Wildlife service have focused on identifying species of

(D) Ibid

birds and other wildlife. Along with this task has been the search for the last remaining feral cats on the island.

Representatives of the wildlife service have accompanied both the 1983 and the 1990 DXpeditions. It is now believed that the last of the remaining cats was destroyed in the April, 1990 DXpedition.

AMATEUR RADIO ACTIVITY on JARVIS ISLAND

The first reported radio transmissions from Jarvis Island were noted in the Official Log, kept by Wyman W. Graf, Private, 11th Medical Regiment during the initial period of settlement by the "colonists" in 1935.^(E) Excerpts from the log follow:

September 3, 1935....."We gathered in the 'radio shack' tonight, and Bill Chadwick sent messages to our folks at home through an amateur in Honolulu. He also sent an article for publication, written by Dr. Coman. The *Itasca* was contacted, but Bill was unable to reach Howland Island."

Manuel Pires, one of the "colonists", was licensed in 1936 as K6HCO^(F). He made many contacts with radio amateurs during his stay on Jarvis Island. He also spent time on Enderbury and Canton Islands during the time of the "colonists". Manny is now residing in Honolulu, Hawaii. His current call sign is KH6AY. His current address is: Manuel Pires, KH6AY, 721 Hind Drive, Honolulu, Hawaii 96821.

Known Call Signs from the Pre-WWI period used on the islands 1935-1941 include:

Baker Island - K6PUL
Howland Island - K6JEG
Enderbury Island - K6HCO, K6QMQ
Canton Island - K6PMO
Jarvis Island - K6HCO, KG6NVJ, K6OWJ

AD1S/KH5 DXpedition of 1983

The AD1S/KH5 group expedition had 4 operators. 16,800 contacts were made during this 5 day visit (November 7-10, 1983).

AH3C/KH5J DXpedition of 1990

The AH3C/KH5J group expedition had 8 operators. 54,600 contacts were made during this 10 day visit (April 13-22, 1990).

(E) Geography and Map Collection, Bishop Museum Library.

(F) On May 31, 1990 members of the AH3C/KH5J met with Manny (KH6AY) and Nose (KH6IJ) at which time Manny recounted his adventures on Canterbury and Jarvis Islands. On January 10th, 1939, Manny was removed from Jarvis Island on the *Roger B. Taney* as a result of a severe case of appendicitis. The emergency evacuation was successful. The *Taney* arrived in Honolulu 3 days later. Manny had a successful operation and is one of the few remaining "colonists" of the Pre-WWII period.

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Research on Separate DXCC Country Status for Jarvis Island

0 Introduction

Jarvis Island qualifies as a separate DXCC country. The research is organized into the following parts to explain this conclusion:

1. Geographical introduction
2. Application of Point 3B.

1 Geographical introduction

An observation point on the west side of Jarvis Island has been located at 0° 22' 37.0" S 160° 1' 36.8" W.¹

To the north and northeast lie five islands which are a part of the Line islands group:

- ° **Kiritimati** (Christmas Island), part of the Republic of Kiribati. The closest point to Jarvis on Kiritimati is the South West Point, at 1° 50.91' N, 157° 32.76' W.² The closest point to Kiritimati on Jarvis is the northeast corner, at 0° 22' 25.3" S, 160° 0' 26.7" W.³ The distance between these two points is 3.32° arc, or 228.95 statute miles.⁴

¹ Measured from US National Ocean Service Chart No. 83116, Islands in the Pacific Ocean.

² Measured from the *National Geographic Atlas of the World*, fifth edition.

³ Measured from US National Ocean Service Chart No. 83116, Islands in the Pacific Ocean.

⁴ All distance calculations are summarized in a spreadsheet, attached to this application. The great circle distances in this application are calculated from spherical trigonometry applied to the latitudes and longitudes. Both *The ARRL Antenna Book* (14th edition) and *Planning and Engineering of Shortwave Links* (Gerhard Braun, published by Siemens Aktengesellschaft Heyden & Son GmbH, 1982) provide the following formula for great circle distance:

$$\cos D = \sin A \sin B + \cos A \cos B \cos L$$

where:

D=arc distance

A= latitude of first location

B= latitude of second location

L= difference in longitude between the two locations.

Southern latitudes are considered negative. Arc distance can be converted into statute miles as follows:

$D * (60 \text{ nautical miles/arc degree}) * (6076.11549 \text{ feet/nautical mile}) / (5280 \text{ feet/statute mile})$ which reduces to:

$D * 69.046767 = \text{statute miles}$

- **Tabuaeran** (Fanning Atoll), part of the Republic of Kiribati. The closest point to Jarvis on Tabuaeran is Grieg Point, at 3° 48' 5" N, 159° 19' 0' W.⁵ The closest point to Tabuaeran on Jarvis is the northern-most shoreline, at 0° 22' 15.4" S, 160° 1' 6.8" W.⁶ The distance between these two points is 4.23° arc, or **292.13 statute miles**.
- **Teraina** (Washington Island), part of the Republic of Kiribati. The closest point to Jarvis on Teraina is about 4° 42' N, 160° 23' W.⁷ The closest point to Teraina on Jarvis is the northern-most shoreline, at 0° 22' 15.4" S, 160° 1' 6.8" W. The distance between these two points is 5.08° arc, or **351.0 statute miles**.
- **Palmyra Atoll**, administered by the United States of America. The closest point to Jarvis on Palmyra Atoll is the southern tip of Bird Island, at 5° 51' 57.0 N, 162° 3' 45.2" W.⁸ The closest point to Palmyra Atoll on Jarvis is the northern-most shoreline, at 0° 22' 15.4" S, 160° 1' 6.8" W. The distance between these two points is 6.5621° arc, or **453.09 statute miles**.
- **Kingman Reef**, administered by the United States of America. The closest point to Jarvis on Kingman Reef is the southern tip of the reef, at 6° 24' 35.4" ~, 162° 22' 0.0" W.⁹ The closest point to Kingman Reef on Jarvis is the northern-most shoreline, at 0° 22' 15.4" S, 160° 1' 6.8" W. The distance between these two points is 7.1743° arc, or **495.36 statute miles**.

To the west lie:

- **Howland Island**, administered by the United States of America. The closest point to Jarvis on Howland Island is the east shoreline, at 0° 47' 55.3" N, 176° 37' 42.4" W.¹⁰ The closest point to Howland Island on Jarvis is the southwest tip, at 0° 23' 6.3" S, 160° 2' 2.8" W.¹¹ The distance between these two points is 16.6361° arc, or **1148.67 statute miles**.
- **Baker Island**, administered by the United States of America. The closest point to Jarvis on Baker Island is the east shoreline, at 0° 11' 39.7" N, 176° 28' 18.3"

⁵ Measured from DMA Chart No. 83158, Tabuaeran Atoll.

⁶ Measured from US National Ocean Service Chart No. 83116, Islands in the Pacific Ocean.

⁷ Measured from US National Ocean Service Chart No. 83015.

⁸ Measured from US National Ocean Service Chart No. 83157, Palmyra Atoll.

⁹ Measured from US National Ocean Service Chart No. 83153, Kingman Reef.

¹⁰ Measured from US National Ocean Service Chart No. 83116, Islands in the Pacific Ocean.

¹¹ Measured from US National Ocean Service Chart No. 83116, Islands in the Pacific Ocean.

W.¹² The closest point to Baker Island on Jarvis is the southwest tip, at 0° 23' 6.3" S, 160° 2' 2.8" W. The distance between these two points is 16.4478° arc, or **1135.66 statute miles**.

- the Phoenix Islands group, of which the closest are:

Enderbury Island, part of the Republic of Kiribati. The closest point to Jarvis on Enderbury Island is the east shoreline, at 3° 8' S, 171° 5' W.¹³ The closest point to Enderbury Island on Jarvis is the southwest tip, at 0° 23' 6.3" S, 160° 2' 2.8" W. The distance between these two points is 11.54° arc, or **797 statute miles**.

Rawaki Island, part of the Republic of Kiribati. The closest point to Jarvis on Rawaki Island is at about 3.51° 8' S, 171.09° W.¹⁴ The closest point to Rawaki Island on Jarvis is the southwest tip, at 0° 23' 6.3" S, 160° 2' 2.8" W. The distance between these two points is 11.48° arc, or **793 statute miles**.

2 Application of Point 3B

Only two points of USA - administered territory lay within 500 statute miles of Jarvis Island: Palmyra Atoll and Kingman Reef. Since all other USA administered territory lies beyond 500 miles, it can be ignored for purposes of this approach.

In this section, §§ 2.1 through 2.3 applies DXCC country criteria Point 3B to show that Jarvis Island qualifies as a separate DXCC country from Palmyra Atoll or Kingman Reef. Then § 2.4 shows that the application of Point 3B is fully consistent with other islands which *are known for certain* to have become DXCC countries through the use of Point 3B (or its antecedents). § 2.5 shows that the use of Point 3B for Jarvis is also fully consistent with other islands which *probably* became DXCC countries through the use of Point 3B (or its antecedents).

¹² US National Ocean Service Chart No. 83116, revised on 1986 May 31, covers Howland, Baker, and Jarvis Islands in detail. However, the chart of Baker Island is marked 'CAUTION; The shape of the island differs considerably from that shown hereon, and bearings of tangents should not be relied upon.' The coordinates for the east shoreline of Baker Island are taken from this chart, and should be sufficiently accurate for the discussions which follow, despite this cautionary note.

¹³ As listed in *The Times World Index - Gazetteer*, The Times Publishing Company, London.

¹⁴ Measured from the *National Geographic Atlas of the World*, fifth edition.

2.1 General discussion

Point 3B states:

"Islands: Where two islands, of the government under Point 1, are totally separated by and intervening DXCC country (also under Point 1), *each* island counts as a separate DXCC country. No minimum distances are required. The test for total separation means that a straight line cannot be drawn from any point on one island to any point on the other island without passing through another DXCC country. This intervening country may be part of either island, another island, or part of a continent."

The text of Point 3B is applied to this case as follows:

- a) "Where two islands, of the government under Point 1..." - The two islands in this case are Palmyra Atoll and Jarvis Island. The point 1 government is the Congress of the United States of America.
- b) "...are totally separated by an intervening DXCC country (also under Point 1)..." - the intervening DXCC country is East Kiribati. The Republic of Kiribati, a former British colony, is a Point 1 country. It received its independence from the United Kingdom on 1979 July 12.
- c) "...No minimum distance is required..."
- d) "...The test for total separation means that a straight line cannot be drawn from any point on one island to any point on the other island without passing through another DXCC country...." - This test is easily met. As will be shown in detail below, a straight line from Jarvis to Palmyra crosses 199.6 statute miles of Kiribati territory. In other words, 44% of the path from Jarvis to Palmyra lies within Kiribati!
- e) "...This intervening country may be part of either island, another island, or part of a continent." - In this case, the intervening country is the island nation of Kiribati, and the particular islands involved are Tabuaeran (Fanning Atoll) and Teraina (Washington Island).

The following sections examine these points in more detail.

2.2 Border of sovereign territory

This section identifies:

- that the USA and the Republic of Kiribati each claim sovereign rights over territory surrounding various islands in this part of the Pacific.
- that the borders of these sovereign territories are well-established.
- that the borders meet the territorial border requirements laid out by the USA and the Republic of Kiribati.

2.2.1 Border around Jarvis Island and Palmyra Atoll

This discussion contains two parts:

- review of the sovereignty documented by the United States.
- review of the borders of sovereignty around Jarvis and Palmyra.

2.2.1.1 United States sovereignty

On March 10, 1983, US President Reagan issued Presidential Proclamation No. 5030. This document establishes "**sovereign rights and jurisdiction** of the United States of America" over an Exclusive Economic Zone. The Proclamation continues:

"The Exclusive Economic Zone of the United States is a zone contiguous to the territorial sea, including zones contiguous to the territorial sea of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands..., and United States overseas territories and possessions. The Exclusive Economic Zone extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured. In cases where the maritime boundary with a neighboring State remains to be determined, the borders of the Exclusive Economic Zone shall be determined by the United States and other State concerned in accordance with equitable principles."

According to the USA Department of State, the maritime borders correspond exactly with the fishing conservation zones which had been announced in 1977, and are introduced in the next section.¹⁵

2.2.1.2 General status of Jarvis Island and Palmyra Atoll

USA administration of Jarvis Island and Palmyra Atoll is uncontested. Any current reference book or atlas lists these areas as being under USA administration.

¹⁵ Telephone conversation with Dr. Robert Smith, USA Department of State.

2.2.1.3 Delineation of borders by the United States

In 1977, the USA claimed the following borders around Palmyra Atoll:¹⁶

"*Palmyra Atoll*: The seaward limit of the fishery conservation zone is 200 nautical miles from the baseline from which the breadth of the territorial sea is measured, except that to the southeast of Palmyra Atoll the limit of the fishery conservation zone shall be determined by straight lines¹⁷ connecting the following coordinates:

1. 7° 55' 04" N 159° 22' 29" W
2. 7° 31' 05" N 159° 39' 30" W
3. 7° 09' 43" N 159° 54' 35" W
4. 6° 33' 40" N 160° 19' 51" W
5. 6° 31' 37" N 160° 21' 18" W
6. 6° 25' 31" N 160° 25' 40" W
7. 6° 03' 05" N 160° 41' 42" W
8. 5° 44' 12" N 160° 55' 13" W
9. 4° 57' 25" N 161° 28' 19" W
10. 4° 44' 48" N 161° 37' 18" W
11. 3° 54' 25" N 162° 12' 56" W
12. 2° 39' 50" N 163° 05' 14" W

At the same time, the following borders around Jarvis Island were defined:¹⁸

"*Jarvis Island*: The seaward limit of the fishery conservation zone is 200 nautical miles from the baseline from which the breadth of the territorial sea is measured, except that to the north of Jarvis Island, the limit of the fishery conservation zone shall be determined by straight lines connecting the following coordinates:

1. 2° 01' 00" N 162° 22' 00" W
2. 2° 01' 42" N 162° 01' 35" W
3. 2° 03' 20" N 161° 41' 33" W
4. 2° 02' 30" N 161° 36' 20" W
5. 2° 00' 13" N 161° 22' 24" W
6. 1° 50' 18" N 160° 20' 42" W
7. 1° 45' 46" N 159° 52' 59" W
8. 1° 43' 31" N 159° 39' 27" W

and except that to the eastward of Jarvis Island, the limit of the fishery conservation zone between point No. 8 and a point at 3° 10' 40" S, 158° 10' 30" W, remains to be determined.

¹⁶ *Federal Register*, Vol. 42 No. 44, March 7, 1977: page 12939.

¹⁷ This document states: "Straight line in this notice means a geodetic line." A geodetic line is defined by *Webster's New World Dictionary* as meaning: designating the shortest surface line between two points on a surface, esp. the curved surface of Earth.

¹⁸ *Federal Register*, Vol. 42 No. 44, March 7, 1977: page 12939-12940.

These limits have been plotted on a section of National Ocean Service Chart No. 83015, Figure 1, along with the straight line path between Jarvis and Palmyra.

2.2.2 Borders around eastern Kiribati

Again, this discussion contains two parts:

- ° review of the sovereignty documented by the Republic of Kiribati.
- ° review of the borders of sovereignty around Jarvis and Palmyra.

2.2.2.1 Republic of Kiribati sovereignty

On May 16, 1983, the Marine Zones (Declaration) Act 1983 of Kiribati entered into force. This law is titled "and Act to make provision in respect of the internal water, the archipelagic water, the territorial sea, and the exclusive economic zone of Kiribati."

Part II §7, "The exclusive economic zone", states:

- "(1) ...For the purposes of any law of Kiribati, the exclusive economic zone of Kiribati comprises those parts of the sea having...as their outer limits a line drawn 200 nautical miles seaward from the outer limits of the inland waters of Kiribati."
- "(5) Where the median line is less than 200 nautical miles from the line which the breadth of the territorial sea is to be measured, the outer limits of the exclusive economic zone extend to the median line."

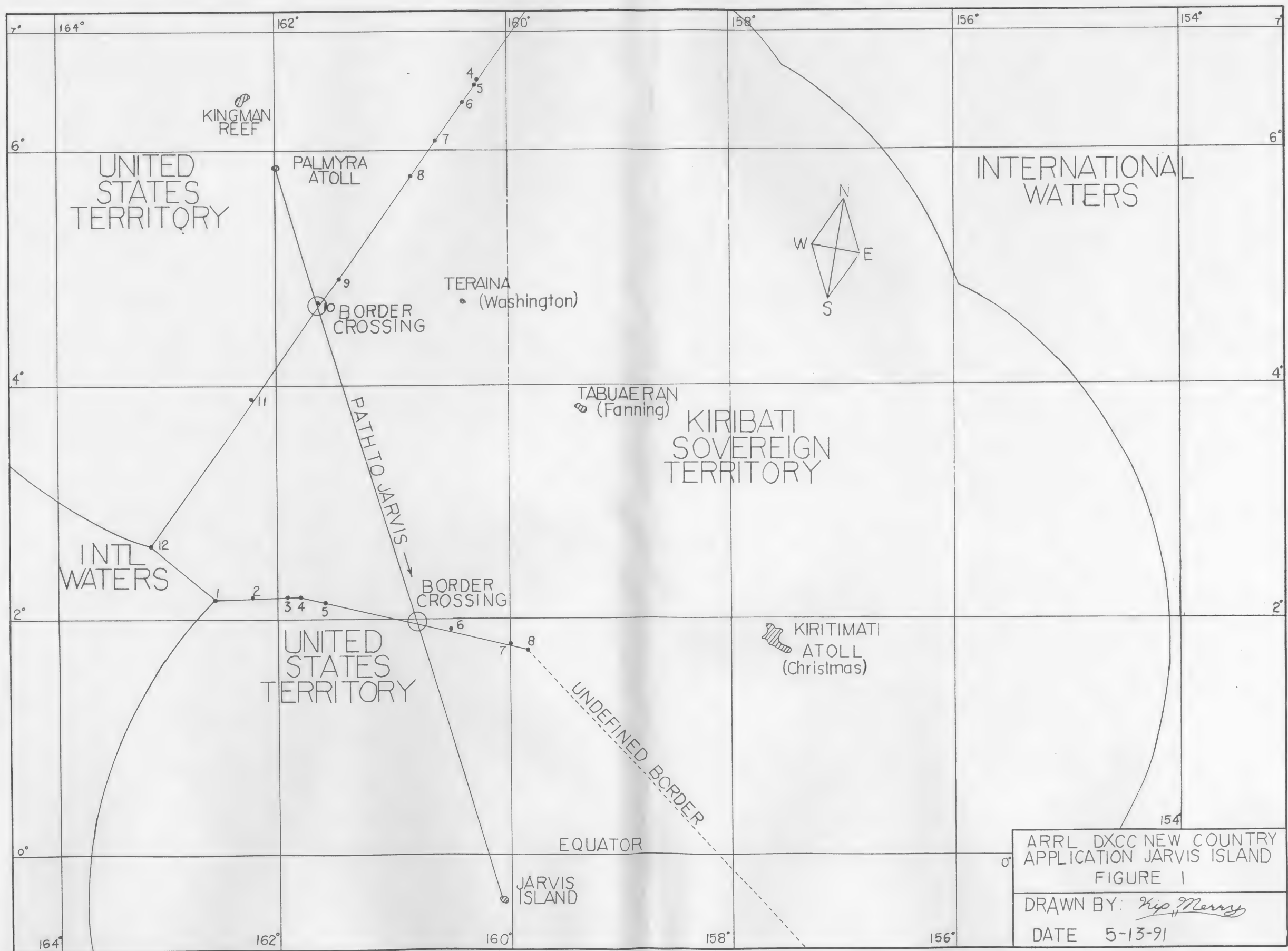
Part II §8, "The Legal character of marine zones", states:

- "(2) Within the exclusive economic zone the Republic of Kiribati has sovereign rights for the purpose..."

Like the USA Presidential Proclamation No. 5030, Kiribati has established sovereign rights over a zone of ocean surrounding each of its islands. In exercising its sovereignty, Kiribati has permitted other countries to carry out certain activities, as follows:¹⁹

"....all States and their nationals shall enjoy in the exclusive economic zone the high seas freedoms of navigation and overflight and of the laying of submarine cables and pipelines, and all other internationally lawful uses of the sea related to those freedoms, compatible with the rules of international law.

¹⁹ Kiribati Marine Zones (Declaration) Act 1983, Part II §9, Rights of States in marine zones.
¶ (6).



These are the only activities which Kiribati specifically allows foreigners to perform in these waters.

The Act also states that, within the exclusive economic zone, the Minister may directly regulate such things as scientific research, exploration and exploitation of energy production, construction, safety zones around islands, environmental measures, and "such other matters as are necessary or expedient to give effect to the rights and obligations of the Republic of Kiribati".

This Act clearly defines that Kiribati exercises sovereignty over maritime zones surrounding each of its islands.

2.2.2.2 General status of Kiritimati, Tabuaeran, and Teraina

Tabuaeran (Fanning Atoll) and Teraina (Washington Island) are uncontested parts of the Republic of Kiribati. Any current reference book or atlas lists these areas as part of Kiribati.

Kiritimati (Christmas Island) was, until 1983, disputed territory. Both the USA and United Kingdom claimed this territory before the independence of Kiribati in 1979. After Kiribati independence, the USA eventually relinquished its claim to Kiritimati (and other islands in the Line and Phoenix island groups) as part of the Treaty of Friendship between the USA and the Republic of Kiribati. This Treaty entered into effect in 1983.

2.2.2.3 Delineation of borders by the Republic of Kiribati

The Republic of Kiribati has yet to file with the United Nations Secretary-General a specific list of geodetic datum which define its borders to any greater precision than that described in the Marine Zones (Declarations) Act 1983. The USA has, on several occasions, offered to formally document the mutual borders between territory administered by the USA and that of the Republic of Kiribati, but to date no formal discussions have started.²⁰ Nevertheless, the Marine Zones (Declarations) Act 1983 is sufficiently clear to allow this analysis to continue.

As quoted in the previous section, the border is 200 nautical miles or the median line landward of the 200 nautical mile limit.²¹

This section analyzes the borders established by the United States, to see if they comply with the requirements specified by the Republic of Kiribati in its Marine Zones (Declarations) Act of 1983.

²⁰ Telephone conversation with Dr. Robert Smith, USA Department of State.

²¹ Marine Zones (Declaration) Act 1983, Part II §7 ¶5.

2.2.2.4 Evaluation of border with Jarvis Island.

This analysis examines the distance between the geodetic data points for the border around Jarvis Island, as specified by the USA, and the approximate nearest points on Jarvis Island, Kiritimati, Tabuaeran, and Teraina. All distances are in *nautical miles*, not statute miles, to facilitate comparison with the legal documents. Note that this table should be considered accurate only to about ± 1 nautical mile, as these calculations did not use the exact coordinates of the baselines around each island.²²

datum point	to Jarvis	to Kiritimati	to Tabuaeran	to Teraina
No. 1	200.9 nmi	289.3 nmi	211.8 nmi	200.1 nmi
No. 2	188.2	268.9	194.1	188.1
No. 3	176.9	249.0	176.7	177.0
No. 4	173.3	243.7	173.1	175.5
No. 5	164.0	229.7	163.8	172.3
No. 6	134.0	167.9	132.9	171.7
No. 7	128.3	140.3	126.9	178.7
No. 8	127.6	126.8	1126.2	183.7

Point No. 1 is located 200 nmi from Jarvis Island, and also 200 nmi from Teraina (Washington Island); all other Kiribati islands are more than 200 nmi from this location. As one proceeds eastward from this point through Point No. 2 to Point No. 3, and equal distance between Jarvis and Teraina is maintained. Arriving at Point No. 3, one is equidistant (177 nautical miles) from Jarvis, Teraina, and Tabuaeran (Fanning Atoll). The line eastward from Point No. 3 to Point No. 8 maintains an equal distance between Jarvis and Tabuaeran; in this area Tabuaeran is closer than Teraina. Finally, at Point No. 8 one is equi-distant (127 nautical miles) between Jarvis Tabuaeran, and Kiritimati Island.

What happens after Point No. 8? In 1977, when this line was developed, the USA and United Kingdom had conflicting claims for Kiritimati Island. To the east and south of Point No. 8, Kiritimati Island is closer to Jarvis than Tabuaeran Atoll. Because the territorial dispute was not resolved in 1977 an official border was not established in the area of the Pacific. The lack of border definition to the east of Jarvis, however, does not affect the path between Jarvis and Palmyra. The Jarvis-Palmyra path lays far to the west of the undefined area, as shown in Figure 1.

²² Baselines around islands do not exactly follow the shoreline. The baseline is permitted to follow the line of any off-shore reef that becomes exposed at low tide, and to take certain other shortcuts. The technical procedure for locating baselines has been defined by the United Nations.

This table show that, within an accuracy of about 1 nautical mile, the line described by points No. 1 through 8 is, in fact, the median line between the Republic of Kiribati and Jarvis Island. This line, therefore, meets the requirements specified by Kiribati's Marine Zones (Declaration) Act 1983.

2.2.2.5 Evaluation of border with Palmyra Atoll

This analysis examines the distance between the geodetic data points for the border around Palmyra Atoll, as specified by the USA, and the approximate nearest points on Palmyra and Teraina.

datum point	to Palmyra	to Teraina
No. 1	202.0 nmi	201.4 nmi
No. 2	174.2	173.6
No. 3	150.1	149.3
No. 4	111.4	110.1
No. 5	109.3	108.0
No. 6	103.1	101.9
No. 7	82.4	81.0
No. 8	68.6	67.4
No. 9	65.0	64.1
No. 10	72.1	71.6
No. 11	117.9	117.9
No. 12	201.7	201.8

Again, within the accuracy of ± 1 nautical mile, the entire line Point No. 1 through Point No. 12 is equidistant between Palmyra Atoll and Teraina. This border line, therefore, also meets the requirements specified by Kiribati's Marine Zones (Declaration) Act 1983.

2.2.3 Border and sovereign territory summary

The map of Figure 1 contains plots of the borders just discussed, plus the straight line path between Palmyra Atoll and Jarvis Island.

The territory around Palmyra Atoll does not touch or join the territory around Jarvis Island at any point. The closest points of these two territories are Point No., 12 of the Palmyra border, and Point No. 1 of the Jarvis border. The distance between these two points is 66.84 statute miles.

The map of Figure 1 also clearly shows that Kiribati territory (around the islands of Teraina and Tabuaeran) lies between the Jarvis and Palmyra territories.

The above sections have demonstrated:

- Both the USA and Republic of Kiribati have established sovereign rights to territory in the Pacific.
- The borders between adjacent territory are clearly defined in the area of a straight line path between Jarvis Island and Palmyra Atoll.
- The border definitions (geodetic data) established by the USA meet the requirements laid out by the Republic of Kiribati for borders.
- The sovereign territory around Palmyra and Jarvis do not touch or join at any point.
- The Sovereign territory of the Republic of Kiribati lies between Jarvis and Palmyra.

2.3 Path between Jarvis and Palmyra

The map in Figure 1 shows the straight line path between Jarvis and Palmyra. The border crossing points are calculated by finding those points which meet the following conditions:

- 1) The three path segments (from Jarvis Island to the Jarvis-Kiribati border crossing, from the Jarvis-Kiribati border crossing to the Palmyra-Kiribati border crossing, and from the Palmyra-Kiribati border crossing to Palmyra Atoll) have a combined distance equal to the great circle path distance from Jarvis to Palmyra. By definition, the great circle path is the shortest path between these two islands. If the border crossings are incorrectly chosen, then the path segments will be slightly crooked, and add up to a longer distance than the great circle distance.
- 2) The Jarvis-Kiribati border crossing is located equidistant to both Jarvis Island and Tabuaeran. this insures that the chosen border crossing is on the median line between these two islands. (By inspecting the map, and reviewing the earlier sections, it is apparent that Tabuaeran is the closest Kiribati island to Jarvis in the neighborhood of the border crossing.)
- 3) The Palmyra-Kiribati border crossing is located equidistant to both Palmyra Atoll and Teraina. Again, this insures that the chosen border crossing is on the median line.

The procedure used was as follows:

- Approximate border crossing points were measured from the map in Figure 1.

- Using a computerized spreadsheet, these crossing points were adjusted slightly until all three conditions were exactly met.

The final border crossings are:

Jarvis-Kiribati border crossing: 1° 53' 55" N, 160° 45' 42" W.

Palmyra-Kiribati border crossing: 4° 39' 7" N, 161° 39' 50" W.

- The complete path is 453.09 statute miles long.
- 164.89 statute miles in the southern segment from Jarvis Island to the Jarvis-Kiribati border.
- 88.18 statute miles in the northern segment from Palmyra Atoll to the Palmyra-Kiribati border
- *200.02 statute miles in the middle segment across the sovereign territory of the Republic of Kiribati.*

Although DXCC Countries List Criteria Point 3B requires *no minimum distance* for the intervening territory, it is interesting to note here that a very substantial portion of the Jarvis-Palmyra path (over 44%) lies in Kiribati sovereign territory.

2.4 Comparison to other known applications of Point 3B.

Point 3B and its predecessors are known for certain to have been used to qualify two *island* DXCC countries: Kure Island and Market Reef. This section demonstrates that the use of Point 3B for Jarvis Island is consistent with these two previous cases.

In addition, this section analyzes other island DXCC countries where Point 3 was probably used. It is shown that the use of Point 3B for Jarvis Island is also consistent with these cases.

2.4.1 Kure Island

The 1961 May issue of *QST*, on page 91, announced the addition of Kure Island and East Pakistan to the DXCC list. The full text of the announcement is as follows:

"DXCC Notes

"Announcement is hereby made of two additions to the ARRL Countries List. The additions are Kure Island and East Pakistan.

"Although Kure Island is the westernmost island of the Hawaiian Islands, its separation from the rest of the Hawaiian chain by Midway places it under Point 3 of the criteria (see page 80, April 1960 *QST*, DXCC Notes). East Pakistan also comes under Point 3 of the Criteria. DXCC credit claims may be made for these additions starting July 1, 1961.

Confirmations for contacts with Kure Island and East Pakistan must be dated November 15, 1945 or later. DXCC claims for either of these additions received before July 1, 1961 will be returned without credit.

"Amateurs interested in the ARRL Countries List are advised that a new Operating Aid No. 7 is available. The list, revised 3/61, is available without charge from the Communications Department, 38 La Salle Road, West Hartford 7, Connecticut."

2.4.1.1 Status of DXCC countries criteria

To put this announcement in proper perspective, it is appropriate to examine the country criteria as they stood at that time. The 1960 April *QST*, page 80 DXCC Notes column stated the following:

"DXCC Notes:

"Basic guiding criteria for determining our Countries List, established as the DXCC standard, were given on page 84, April 1959 *QST*.²³ Some amateurs have asked that we tell them the specific distance that would serve as a guide when applying points two and three of that discussion. This is possible, since the several applications of the policy made over a number of years make for well-established precedents. Here then are those provisions to answer possible questions such as may arise from time to time.

"2. The geographical separation. With regard to geographical separation by water where the place in question has no political/administrative sovereignty or politically attached to be considered for separate country status in the ARRL countries list. This point shall not apply to island in a natural island grouping.

"3. Where foreign territory divides a country, there will be a minimum distance of 75 miles of foreign land separating the two areas of places in question. In the case of island groups this distance requirement does not apply."²⁴

To complete the picture of the country criteria as they stood when Kure Island was added, the full text of the 1959 policy is quoted here:

"Countries List Policy

Occasionally ARRL gets letters expressing the wishful thought that the ARRL Countries List be frozen; no additions and no deletions, or any changes in the future. Then again, wishful thinkers during the tougher side of the sunspot cycle and at other times often suggest island areas that ought, in their opinion, to be raised to the status of countries in Operating Aid No. 7. This official "Countries List" is issued in revised form annually as well as given in each *Handbook*. As for a list with *never* a change it must be said that the changing political and geographical facts of life always have to be

²³ Actually, this was on page 84 of the July 1959 *QST*.

²⁴ The remainder of this DXCC Notes column discusses credits for Palestine, deletion of credit for the LZ1DZ/ZA operation, and the addition of Auckland & Campbell Islands.

taken into account. The political framework of the world is subject to change. If there were no changes there might be some momentary acclaim but a list soon out of date would soon be subject to ridicule as to listings both obsolete and unrealistic. On the other hand, there is of course no justification for raising Long Island or Catalina Island or comparable territory having no pronounced geographical separation and no autonomy from a parent nation to countries-list status.

"On the surface it might appear a simple matter to act at once on every *proposed* new country. Without any pretense that our list is perfect, it is well built on specified policies for the most part and the fact remains that we must have a reference list to follow for all comers. Let us make it clear that such changes as have to be made are not for the sake of change but for good reason. In today's scheme of things, the League rests the case.

No other discussions of Point 3 to Kure Island, Midway was considered "foreign territory". Midway Island was present on the initial, post-WW II DXCC countries list, and was listed separately from the Hawaiian Islands.²⁵

In 1960 the Hawaiian Islands were already a new state of the United States. Midway Island, however, remained as an "unincorporated territory" and a major US naval base.

2.4.1.2 Geography for Kure Island

The closest islands of the Hawaiian chain to Kure Island (28° 25' N 178° 25' W)²⁶ are:

- ° the Midway group (28° 15' N 177° 25' W): Sand Island, Eastern Island, Seward Roads, Sand Islet, and other small islets. The distance from Kure to Midway is about 62 statute miles.
- ° the Pearl and Hermes Reef area (27° 48' N 175° 51' W): North Island, Southeast Island, Grass Island, Seal Island, etc. The distance from Kure to Pearl and Hermes Reef is about 162 statute miles.
- ° Lisianski Island (26° 4' N 173° 58' W). The distance from Kure to Lisianski Island is about 318 statute miles.

2.4.1.3 Discussion

²⁵ *QST*, 1947 February, page 50: "Postwar Countries List".

²⁶ Exact mileage calculations are not required for the following discussion. The geographical coordinates here are approximate coordinates, taken near the center of each island or island group. The coordinates in this section are from *The Times Index-Gazetteer of the World*. More exact measurements can be obtained from National Ocean Survey Chart Numbers 19022 and 540.

The *QST* announcement is quite clear: Kure Island qualified under Point 3 of the country criteria: "Where foreign country divides a country..."

Even a cursory inspection of a map of the Hawaiian island chain shows clearly that the path from Kure Island to Lisianski Island *never crosses any land* in the Midway island group.

National Ocean Survey Chart No. 19022 also shows that some paths pass quite close to Midway islets. However, many paths exist between Kure Island and the various islands of Pearl & Hermes Reef which *never cross any land* in the Midway island group.

One must conclude, therefore, that even in the very first application of Point 3 to define a new DXCC country, there was no expectation that intervening territory must be dry land. But if dry land was not required, what kind of geographical layout was adequate to "divide" a country in 1961 and cause a new entry to be added to the countries list? Published contemporary material from 1961 does not provide a specific mathematical test for "division".

Would the use of the borders around Midway, defined by the USA in 1977, be adequate to "divide" Kure from the remainder of the State of Hawaii? The 1977 *Federal Register* announcement states:

"Hawaii and Midway island. The seaward limit of the fishery conservation zone is 200 nautical miles from the baseline from which the territorial sea is measured."

This boundary has been drawn on Chart No. 19022. In addition, the Kure-Midway and the Midway-Hawaii median lines have been sketched.²⁷ It is quite clear that *all* paths from Kure to any other Hawaiian island cross through territory within the Midway boundaries just described.

Many possible ideas of what was in the minds of those responsible for the 1961 Kure decision could be imagined. We do *not* suggest that the borders defined in 1977 around Midway Island were considered in the 1961 decision. It seems inappropriate, and probably unnecessary in this case, to speculate what exactly was meant by "division" in 1961. Three points, however, seem indisputable:

²⁷ These median lines are not described in any formal USA announcement. The 1977 March 7 *Federal Register* announcement does not draw any distinction between borders around the fifty United States and borders around other unincorporated territories which the USA administers.

- a) In 1961, Midway was considered to have "divided" or "separated" Kure from the rest of the State of Hawaii - even though many paths between Kure and other parts of Hawaii could be drawn without crossing the islands of Midway.
- b) If Midway was considered a "foreign country", and its borders defined consistent with the 1977 USA announcement, then the area within the Midway borders would indeed completely separate Kure from the rests of Hawaii. In other words, the use of these borders is *consistent with* (but not necessarily *the reason for*) the 1961 decision.
- c) One other observation stands out in comparing the Kure case to Jarvis. For Kure Island, Midway was considered a "foreign country". But Hawaii is a state within the USA, and the USA administers Midway. With Jarvis Island, the intervening territory is the Republic of Kiribati, a completely different and sovereign nation from the USA (which administers both Jarvis and Palmyra). In this respect, the case for separation by an intervening country is much stronger for Jarvis than it was for Kure!

2.4.2 Market Reef

The March 1970 issue of *QST* carried the following announcement on page 84:

"DXCC Notes

"Announcement is hereby made of the addition to the ARRL Countries List of *Market*. Market is an island located exactly on the boundary line between Finland and Sweden and directly opposite the Aland Islands. Separate country status for Market is in accordance with Point 3 of the criteria (see page 88, February 1969 *QST*). Operation has taken place from Market under the call sign OJØMR.

"Confirmations for contacts with Market may be submitted for DXCC credits starting March 1, 1970. Confirmations submitted before March 1, 1970 will be returned without credit."

2.4.2.1 Status of DXCC countries criteria

Again, to put the Market Reef announcement in perspective, it is appropriate to review the countries criteria, as they existed at that time. The reference made to the February 1969 *QST* is, in fact, where the then-current DXCC countries criteria were laid out in full:

"DXCC Criteria

"The ARRL Countries List is the result of some 31 years of progressive changes in DXing. The full list will not necessarily conform completely with the criteria since some of the listings were set up and recognized from pre-

WWII. The general policy has, however, remained substantially the same in the makeup of the list and only specific mileages have been added. The specific mileages in Point 2(a) and Point 3, mentioned in the following, have been used in considerations made April 1960, and after. The specific mileage in Point 2(b) is being used in considerations made in and after April, 1963.

"Any land area in the world can be placed in one or more of the following categories. Where the area in question meets at least one of the points in the criteria it may be considered as a separate entity, i.e., a country, for our Countries List:

"1. Government/Administration: An island, or a group of islands, not having its own government or distinctively separate administration, is considered as a separate entity under the following conditions:

"2(a). Islands situated off shore from their governing or administrative area, must be geographically separated by a minimum of 225 miles of open water. This point is concerned with islands off shore from the mainland *only*. This point *is not* concerned with islands which are part of an island group or are geographically located adjacent to an island group.

"2(b). Islands forming part of an island group or which are geographically located adjacent to an island, or island group, which have a common government or administration, will be considered as separate entities provided there is at least 500 miles of open water separation between the two areas in question.

"3. Separation by foreign land: In the case of a Country, such as that covered by Point 1, which has a common government or administration but which is geographically separated by land which is foreign to that country, if there is a complete separation of the Country in question by a minimum of 75 miles of foreign land, the Country is considered as two separate entities. This 75 miles of land is a requirement which is applicable to land areas *only*. In the case of areas made up of a chain of island, there is no minimum requirement concerned with the separation by foreign land."

No other discussion of the countries criteria occurs between the February 1969 *QST* and the announcement of Market Reef.

2.4.2.2 Geography for Market Reef

Market Reef is located at about 60° 18' N 19° 8' E.

The Aland Islands are a large collection of islands, laying towards the east of Market Reef. bearing between 60° and 135°.

2.4.2.3 Discussion

Most maps of the Baltic area do not show Market Reef. Some paths from Market Reef to other parts of Finland (e.g., to the city of Turku) cross over the Aland Islands.

However, there are also many paths (bearings between 15° and 60°) between Market Reef and other parts of Finland which *do not cross any land* in the Aland Islands group. These paths connect Market Reef with other islands and the coastline of northern and central Finland. The shortest appears to be between Market Reef and the Finnish coastal city of Uusikaupunki (lighthouse at 60° 48' N, 21° 30' E²⁸), a distance of only 87.4 statute miles across the open waters of the Gulf of Bothnia.

As in the case of Kure Island, Point 3 was successfully applied to add a new DXCC country, even though direct paths between Market Reef and the rest of Finland over open water existed.

Would the use of the border between Sweden and Finland in the Gulf of Bothnia, in conjunction with the median line between the Aland Islands and Finland, be sufficient to provide the "complete separation" called for in the 1969 wording of Point 3? With these borders and median lines taken into consideration, all paths between Market Reef and any other part of Finland either:

- cross one of the Aland Islands, or
- cross the area surrounding the Aland Islands which is enclosed by the Swedish-Finnish border and by the median line between the Alands and Finland.

Again, we do *not* suggest that these borders and median lines were considered in making the 1970 Market Reef decision. Two points, again, seem indisputable:

- a) In 1970, the Aland Islands were considered to have "completely separated" Market Reef from the rest of Finland - even though many paths between Market Reef and other parts of Finland could be drawn without crossing the land making up the Aland Islands.
- b) If one considers the border between Sweden and Finland, and the median line between Finland and the Aland Islands, then the area within these borders would indeed completely separate Market Reef from the rest of Finland. In other words, the use of these borders is *consistent with* (but not necessarily *the reason for*) the 1970 decision.

²⁸ *The Times World Index-Gazetteer*

2.5 Are there any other probable Point 3 island DXCC countries?

Point 3 first came into existence in the DXCC written countries criteria in the 1960 April *QST* announcement. Since 1960 April, this Point has been specifically mentioned in a *QST* announcement as applying to only two cases involving island: Kure Island and Market Reef.

Are there other cases of island DXCC countries where Point 3, although unmentioned, was the qualifying criteria? For the sake of completeness, several probable cases are discussed below.²⁹

2.5.1 Navassa Island

Prior to 1950 April, at least one country was added to the DXCC list under circumstances where it appears the concept behind Point 3 might possibly have been applied. This possibility is Navassa Island. An inspection of any map of this region shows that paths to other parts of the USA cross the land of islands such as Cuba or Hispaniola. The *QST* announcement in 1954 November, on page 64, does not explain the reasoning for adding Navassa to the list:

"DXCC Notes:

"Announcement is hereby made of the addition to the ARRL Postwar Countries List of Navassa Island. This island is a United States possession located approximately 35 miles due west of Haiti, 80 miles due east northeast of Jamaica and 110 miles south of Calmanera, Cuba.

"DXCC credit will be given starting January 1, 1955, for creditable confirmations dated on or after November 15, 1945. Confirmations received prior to January 1, 1955, for this country will be returned without credit.

"In future ARRL DX Competition, those making contact with amateur stations located in Navassa Island may claim credit for a separate country in line with DXCC rules".

2.5.2 Tromelin Island

At first glance, it appears that Tromelin Island may involve Point 3. The 1956 March *QST* carried an uninformative announcement regarding Tromelin Island on page 74:

"DXCC Notes:

"Announcement is hereby made of the following addition to the ARRL Countries List. The addition will be the island of Tromelin. This island is

²⁹ NX1L's draft worksheet was consulted to determine which present DXCC countries qualified, or probably qualified, under Point 3.

located approximately 260 miles off NE Madagascar in 54 degrees longitude.

"DXCC Credit will be given starting May 1, 1956, for creditable confirmations dated on or after November 15, 1945. This will permit foreign amateurs to start receiving credits at the same time as those in USA. Confirmations received prior to May 1, 1956 for this country will be returned without credit.

"In future ARRL DX Competitions, those making contact with amateur stations located on the island of Tromelin may claim credit for a separate country in accordance with DXCC rules."

2.5.3 Europa, Bassas da India, and Juan de Nova

The 1963 April *QST*, page 82 carried the following announcement:

"DXCC Notes:

"Announcement is hereby made of the addition to the ARRL Countries List of *Juan de Nova*. This listing will encompass the islands of Juan de Nova, Bassas da India, and Europa. These three islands are French territory under the administration of the Overseas Department of Reunion. Located in the Mozambique Channel, they are separated from Reunion by the Republic of Malagasy. Prior to the independence of Madagascar (June 15, 1960), these islands were under the administration of Madagascar.

"DXCC credit claims for contacts with Juan de Nova may be made starting June 1, 1963. Such confirmations must be for contacts made June 25, 1960 or later. Confirmations for Juan de Nova credit received before June 1, 1963 will be returned without credit."

Although Point 3 is not specifically mentioned, the reference to "separated from Reunion by the Republic of Malagasy" and the use of the June 25, 1960 start date (when the islands were no longer administered by Madagascar) leave little doubt that Point 3 was used as the qualifying criteria.

An examination of maps of this area show that all paths from these three islands to Reunion Island cross over the Island of Madagascar (Malagasy Republic).

2.5.4 Glorieuses Islands

Two months after the Juan de Nova announcement, the 1963 June *QST* carried the following notice on page 92:

"DXCC Notes:

"Announcement is hereby made of the addition to the ARRL Countries List of *Glorioso Islands*. Glorioso Islands are French territory under the administration of the Overseas Department of Reunion and Located off the northern tip of the Malagasy Republic, which separates them from Reunion. DXCC credit claims for contacts with the Glorioso Islands may be

made starting August 1, 1963. Such confirmations must be for contacts made June 25, 1960 or later. Confirmations for Glorioso Islands credit received before August 1, 1963 will be returned without credit."

Following the same logic as for Juan de Nova, there seems little doubt that Point 3 (although not specifically mentioned in the announcement) was used as the qualifying criteria.

An examination of maps of this area show that all paths from the Glorieuses to Reunion Island cross over the island of Madagascar.

2.5.5 Discussion

This section § 2.5 above has reviewed all current island DXCC countries which probably qualified under Point 3. All have paths which pass over the land of intervening islands which belong to other governments.

2.6 Other observations

Questions proposed by others:

2.6.1

"When you draw the straight line, you are only concerned about the territorial waters of Kiribati. Will it not be necessary to consider the territorial waters of the United States too? Will it be impossible to draw a straight line between the US territorial waters around Jarvis and those around Palmyra?"

The discussion in § 2 above considered the sovereign territory of the Republic of Kiribati as well as that around Jarvis Island, Palmyra Atoll, and Kingman Reef. The territory around Jarvis is fully separated from that around Palmyra-Kingman by territory of the Republic of Kiribati.

It is not necessary to consider drawing straight lines between arbitrary points in waters around Jarvis and around Palmyra-Kingman. Point 3B states clearly "...The test for total separation means that a straight line cannot be drawn from any point *on one island* to any point *on the other island*..". Therefore, straight lines between land are the only lines which need to be considered.

2.6.2

"If territorial waters are considered, what will happen to DXCC Rule 8? Should 'contacts with ships and boats, anchored or underway, and

airborne aircraft" be counted as long as they are within or above some country's territorial waters?"

There is no relation between the use of Point 3B for Jarvis (or any other island) and the appropriateness of Rule 8. This application does *not* suggest in any way that Rule 8 should be changed to permit contacts with boats and aircraft to count for DXCC. The fact that a boat might be in the territorial waters of some DXCC country has not caused radio contacts with that boat to count for DXCC in the past. It is exactly analogous to the fact that contacts with an aircraft in the airspace (e.g., above the land) of a DXCC country also do not count for DXCC under Rule 8. Aircraft resting on the ground and ships tied up in harbor are also similar situations, and contacts with these do not count for DXCC. There seems to be no reason to change this for the future - and there is no suggestion in any of the discussion here regarding Jarvis Island that any change to Rule 8 is necessary, desirable, contemplated, or even wished for.

2.7 Final remarks on applying Point 3B to qualify Jarvis

This section has established the following facts:

1. The USA administers Jarvis Island, Palmyra Atoll, and Kingman Reef.
2. The USA has laid out borders around Jarvis and around Palmyra-Kingman, within which the USA exercises sovereign rights.
3. Kiritimati Island (Christmas Island), Tabuaeran (Fanning Atoll), and Teraina (Washington Island) are part of the Republic of Kiribati.
4. The Republic of Kiribati has defined borders around Kiritimati, Tabuaeran, and Teraina, within which the Republic of Kiribati exercises sovereign rights.
5. The mutual borders defined by the USA are fully consistent with the border requirements established by the Republic of Kiribati.
6. The sovereign territory around Palmyra-Kingman does not connect with the sovereign territory around Jarvis; territory of the Republic of Kiribati lays in between.
7. All straight line paths from Jarvis to Palmyra cross 200 statute miles of Kiribati territory.
8. The test for total separation described in Point 3B is fully met.

Furthermore, the section examined both previous cases where Point 3B (or its antecedent, Point 3) is *known for certain* to have been successfully applied to create a new island DXCC country:

9. Many straight line paths between Kure Island and other islands of Hawaii exist which are less than 500 statute miles in length, and which do not cross the land of any Midway island or islet. If modern borders and median lines around Midway are used, all such straight line paths cross the enclosed territory around Midway.

10. Many straight line paths between Market Reef and the Finnish coastline exist which are less than 100 statute miles in length, and which do not cross the land of any of the Aland Islands. If modern borders and median lines around the Alands are used, all such straight line paths cross the enclosed territory around the Aland Islands.
11. The use of Point 3B to qualify Jarvis Island as a separate DXCC country is fully consistent with the use of Point 3B (or its antecedents) in the past to qualify Kure Island and Market Reef.

Finally, this section examined all previous cases where Point 3B (or its antecedents *probably was used* to successfully create a new island DXCC country:

12. For Navassa Island, Tromelin, Europa/Bassas da India/Juan de Nova, and Glorieuses Islands, all straight line paths to other land under the same administration cross the land of other DXCC countries.
13. The use of Point 3B to qualify Jarvis Island as a separate DXCC country is, therefore, also consistent with the *probable* use of Point 3B (or its antecedents) in the past in these cases as well.

Since

- the tests in Point 3B are fully met for Jarvis Island; and
 - the use of Point 3B is completely consistent with all known and probable past applications to successfully create an island DXCC country;
- therefore, Jarvis Island should be placed on the DXCC Countries List as a separate DXCC country.

APPENDIX³⁰

- I. Jarvis Island National Wildlife Refuge, Honolulu, Hawaii, *Annual Narrative Report*, Calendar year 1986, US Dept. of the Interior, Fish and Wildlife Service, National Wildlife Refuge System
- II. *Panala'au Memoirs*, by E. H. Brian, Jr., Pacific Scientific Information Center, Bernice P. Bishop Museum, Honolulu, Hawaii, Copyright 1974
- III. *Jarvis Island*, Official Log, by Wyman W. Graf, March 25-October 5, 1935, Geography and Map Collection, Bernice P. Bishop Museum, Honolulu, Hawaii
- IV. Copy of QSL card from KG6NVJ to W8BKP, QSO with Jarvis Island, September 17, 1938
- V. Actual QSL cards for AD1S/KH5 (1983) and AH3C/KH5J (1990) DXpeditions
- VI. Correspondence, FCC license, and Special Use Permit for the AH3C/KH5J (1990) DXpedition
- VII. Expedition Report: *Jarvis Island National Wildlife Refuge*, by Mark J. Rauzon, June, 1990
- VIII. Map, *Pacific Island Nations and their 200 Mile Exclusive Economic Zones*, published jointly by the State of Hawaii Department of Business and Economic Development and the Pacific Basin Development Council, January, 1989
- IX. News article, *Pacific isles trying to solve economic zone puzzle*, by Stu Glauberman, Star-Bulletin & Advertiser, Honolulu, January 14, 1990

³⁰ Further references and information can be made available upon request.

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX I

Jarvis Island National Wildlife Refuge
Honolulu, Hawaii

Annual Narrative Report

Calendar Year 1986

by

U.S. Department of the Interior

Fish and Wildlife Service
National Refuge System

JARVIS ISLAND
NATIONAL WILDLIFE REFUGE

Honolulu, Hawaii

ANNUAL NARRATIVE REPORT

Calendar Year 1986

U.S. Department of the Interior
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

JARVIS ISLAND NATIONAL WILDLIFE REFUGE

	Page
INTRODUCTION	1
TABLE OF CONTENTS	i
A. HIGHLIGHTS	2
B. CLIMATIC CONDITIONS	2
C. LAND ACQUISITION	2
D. PLANNING	
1. Master Plan	NTR
2. Management Plan	NTR
3. Public Participation	NTR
4. Compliance with Environmental and Cultural Resource Mandates	NTR
5. Research and Investigations	2
6. Other	NTR
E. ADMINISTRATION	
1. Personnel	NTR
2. Youth Program	NTR
3. Other Manpower Programs	NTR
4. Volunteer Programs	NTR
5. Funding	NTR
6. Safety	NTR
7. Technical Assistance	NTR
8. Other	NTR
F. HABITAT MANAGEMENT	
1. General	3
2. Wetlands	NTR
3. Forests	NTR
4. Croplands	NTR
5. Grassland	NTR
6. Other Habitats	NTR
7. Grazing	NTR

F. HABITAT MANAGEMENT (Cont.)

8.	Haying	NTR
9.	Fire Management	NTR
10.	Pest Control	NTR
11.	Water Rights	NTR
12.	Wilderness and Special Areas	NTR
13.	WPA Easement Monitoring	NTR

G. WILDLIFE

1.	Wildlife Diversity	NTR
2.	Endangered and/or Threatened Species	NTR
3.	Waterfowl	NTR
4.	Marsh and Waterbirds	NTR
5.	Shorebirds, Gulls, Terns, and Allied Species	3
6.	Raptors	NTR
7.	Other Migratory Birds	NTR
8.	Game Mammals	NTR
9.	Marine Mammals	NTR
10.	Other Resident Wildlife	NTR
11.	Fisheries Resources	NTR
12.	Wildlife Propagation and Stocking	NTR
13.	Surplus Animal Disposal	NTR
14.	Scientific Collections	NTR
15.	Animal Control	4
16.	Marking and Banding	NTR
17.	Disease Prevention and Control	5

H. PUBLIC USE

1.	General	NTR
2.	Outdoor Classrooms - Students	NTR
3.	Outdoor Classrooms - Teachers	NTR
4.	Interpretive Foot Trails	NTR
5.	Interpretive Tour Routes	NTR
6.	Interpretive Exhibits/Demonstrations	NTR
7.	Other Interpretive Programs	NTR
8.	Hunting	NTR
9.	Fishing	NTR
10.	Trapping	NTR
11.	Wildlife Observation	NTR
12.	Other Wildlife Oriented Recreation	NTR
13.	Camping	NTR
14.	Picnicking	NTR
15.	Off-Road Vehicling	NTR
16.	Other Non-Wildlife Oriented Recreation	NTR
17.	Law Enforcement	NTR
18.	Cooperating Associations	NTR
19.	Concessions	NTR

I. EQUIPMENT AND FACILITIES

1.	New Construction	NTR
2.	Rehabilitation	NTR
3.	Major Maintenance	NTR
4.	Equipment Utilization and Replacement	NTR
5.	Communications Systems	NTR
6.	Computer Systems	NTR
7.	Energy Conservation	NTR
8.	Other	NTR

J. OTHER ITEMS

1.	Cooperative Programs	NTR
2.	Other Economic Uses	NTR
3.	Items of Interest	NTR
4.	Credits	5

K.	FEEDBACK	NTR
----	--------------------	-----

L. INFORMATION PACKET - - - (inside back cover)

INTRODUCTION

Jarvis Island National Wildlife Refuge is located 20 miles south of the equator about 1,300 miles south of Honolulu and 1,000 miles east of Baker and Howland Islands. Jarvis Island Refuge contains 1,100 acres of land and 36,419 acres of submerged land and water. The island is uninhabited and vegetated only by grasses, prostrate vines, and low-growing shrubs the scant rainfall, constant wind, and burning sun.

The refuge was established by the Secretary of the Interior in 1974 when management responsibility was transferred from the Office of Territorial Affairs to the Fish and Wildlife Service. It is managed primarily as nesting and roosting habitat for about 20 species of seabirds and shorebirds.



Jarvis Island with colony of Lesser Frigatebirds
in the foreground. (Stewart I. Fefer)

A. HIGHLIGHTS

Jarvis Island was visited from approximately 1100 hours on 19 April to 0100 hours on 20 April 1986. This was the first visit by Service personnel to the refuge since two refuge staff visits were made to Jarvis Island in 1983 to eradicate feral cats, monitor seabird populations, and supervise four amateur radio operators. The purpose of this visit was to census seabird populations, sample vegetation, check for feral cat sign, and survey the island for contaminants.

B. CLIMATIC CONDITIONS

Climatic conditions at Jarvis Island are unknown for the reporting period. No remote-sensing instrumentation was operating to furnish meteorological data. Data collected from other Central Pacific locations during the year indicated near-normal conditions with no evidence of the "El Nino" conditions that adversely impacted the Jarvis Island seabird populations in 1982 and 1983. The vegetation on the island was sparse and the majority appeared dead. This indicates it has been a drier year than on Baker and Howland Islands.

D. PLANNING

On 8 May 1986 a meeting was held between several Service personnel and Mr. Paul Visher, Vice President of Hughes Aircraft. The purpose of the meeting was to explain to Mr. Visher the regulations covering use of the National Wildlife Refuge System and management objectives of the remote islands refuges (specifically Jarvis Is. NWR). Mr. Visher presented a proposal to launch satellites from Jarvis Island as a back up to launching from their first choice of Canton Island, a former U. S. possession now part of the country of Kiribati. They were proposing to dredge a lagoon with a 1,000 ft diameter and 20 ft depth on the southwest corner of the island.

A preliminary determination was made that the proposed use of the island was not compatible with the purpose for which the refuge was established. The noise and heat generated from a launch would likely cause significant disturbance and mortality to nesting migratory birds. The Refuge had no further contact with Hughes Aircraft on this proposal.

5. Research and Investigations

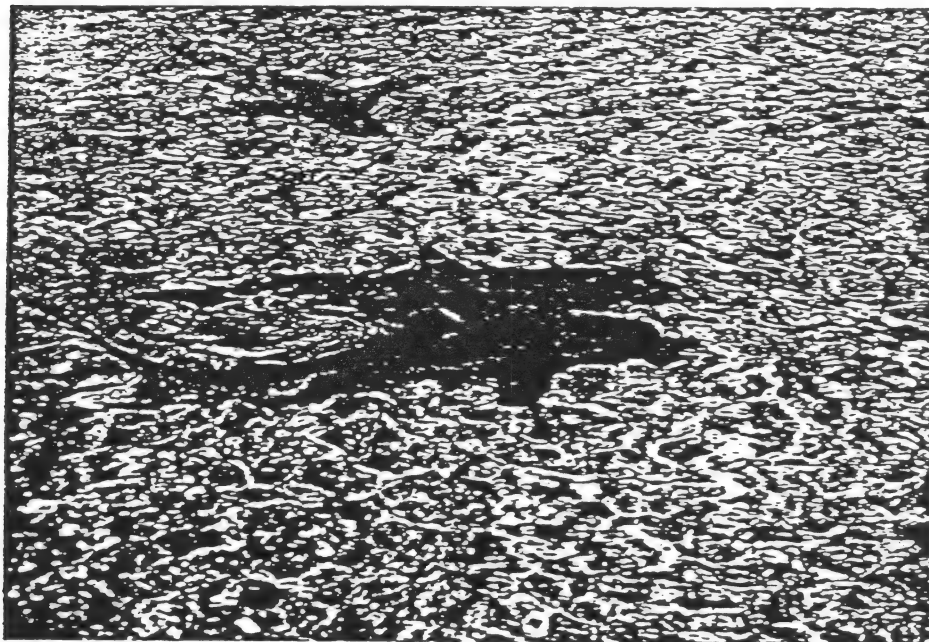
Jarvis Island was visited on 19 April 1986 by Refuge Biologist Stewart Fefer, Steven Berendzen, Assistant Manager Hawaiian Wetlands Refuges and Doug Forsell of the Alaska Fish and Wildlife Research Center. Jarvis was visited using the RV Feresa on the return trip from Howland and Baker Islands. The details of this visit are reported in the following report: Berendzen, S. L., D. J. Forsell, and S. I. Fefer. 1986. Expedition Report -- Jarvis Island, April 19, 1986. Administrative Report U.S. Fish and Wildlife Service, Hawaiian and Pacific Islands NWR Complex. 14 pp.

F. HABITAT MANAGEMENT

1. General

Habitat management on this island is based on the philosophy that the resident populations of seabirds and other wildlife will return to a natural state if environmentally destructive conditions resulting from former habitation of the islands are removed or controlled. Past management efforts have taken two forms: control of introduced cats and the destruction of debris. The natural state of these islands is maintained by a restrictive policy of limited entry and of allowing only those activities that would be beneficial to the wildlife populations. The fact that the nearest inhabited island is 240 miles away facilitates this type of management.

G. WILDLIFE



Black tip reef sharks patrol the landing beach at Jarvis Island. (Stephen Berendzen)

5. Shorebirds, Gulls, Terns, and Allied Species

The results of the seabird surveys are listed in Table 1. The populations seem to be relatively stable but a lack of surveys in April precludes comparison with past years.



Red-tailed tropicbird chick in shaded nest covered by an old rusted out 55 gallon drum. (Richard Wass)

Table 1. Results of migratory bird surveys conducted at Jarvis Island on 19 April 1986.

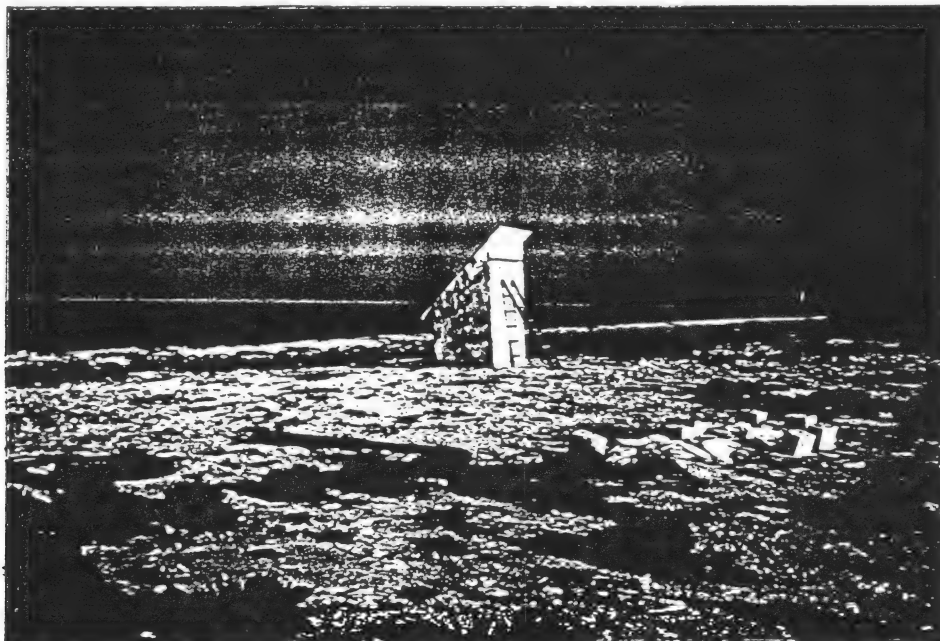
Species	Nests or Territories	Estimated Population
Red-tailed Tropicbird		85
Masked Booby	1,963 t	4,564
Brown Booby	13 t	72
Red-footed Booby	69 t	258
Great Frigatebird	167 n	334
Lesser Frigatebird	609 n	1,218
Wandering Tattler		4
Gray-backed Tern	4 n	18
Brown Noddy		322
Blue-gray Noddy		1

15. Animal Control

The island was searched carefully for cats and their sign both during the day and at night with lights. No cats were observed and the only sign found were several scats which were quite old and may have persisted for years. The survey crew agreed that it is very unlikely that there are cats remaining on the island.

17. Disease Prevention and Control

The Island was searched for contaminants possibly left by past military operations or various research efforts since world War II. The island is relatively free of contaminants except for about 15 Lead-Acid batteries left at the remote weather station on the east end of the Island. The installation was deactivated about 1981 but the building and debris remains. The acid has evaporated and the lead should be properly disposed of in the near future. Dr. Martin Vitousek the project leader of the station stated he paid the crew dismantling the station to remove the batteries. Other debris left on the island in past years continues to deteriorate and has been manipulated by refuge personnel over the years so as not to present hazards to the birds. Some of the debris actually provides nesting and roosting habitat for the birds.



Remains of remote weather station deactivated in 1981. Some of the lead-acid batteries left on the island are on the ground in the lower right of the photo. (Stewart I. Fefer)

J. OTHER ITEMS

4. Credits

This narrative report was written by Douglas J. Forsell and the section on Rose Atoll was co-authored by Richard C. Wass. The entire report was reviewed by Jerry F. Leinecke and Stewart I. Fefer.

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX II

Panala'Au Memoirs (excerpts)

by

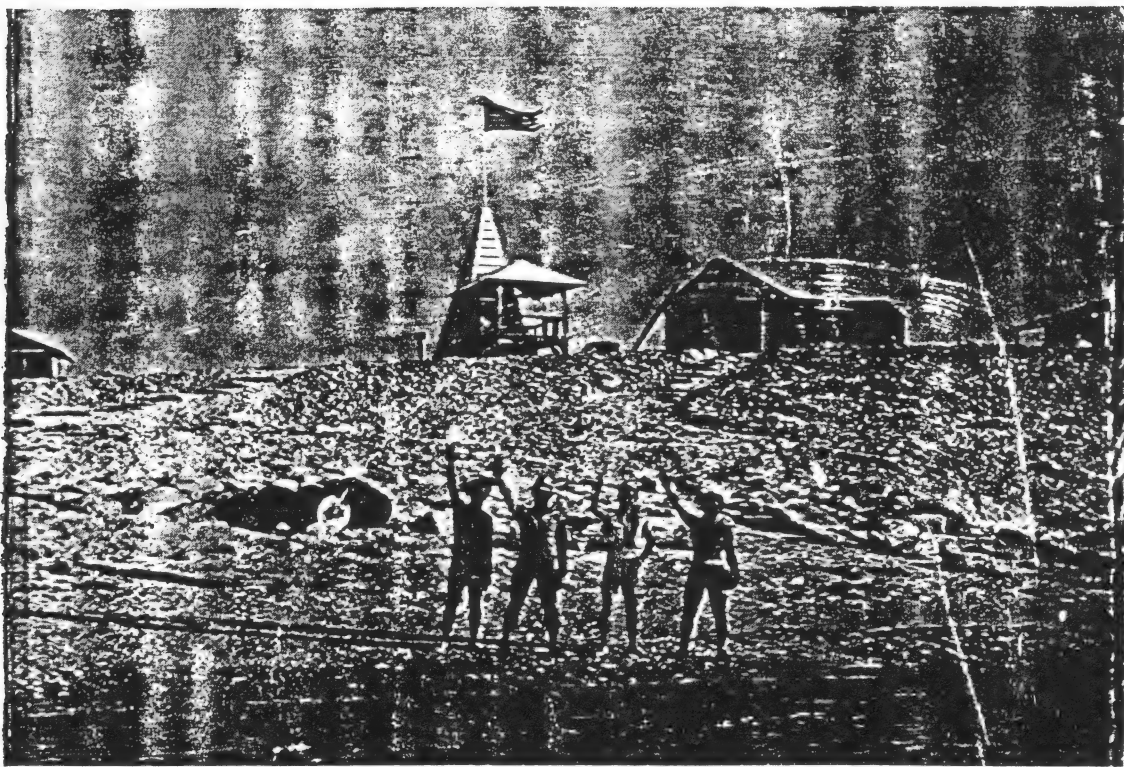
E. H. Bryan, Jr.

Pacific Scientific Information Center
Bernice P. Bishop Museum
Honolulu, Hawaii

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PANALA'AU MEMOIRS

By
E. H. Bryan, Jr.



Pacific Scientific Information Center
Bernice P. Bishop Museum, Honolulu, Hawaii 96818

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1974

reaches its highest elevation, seldom more than 20 feet, around the crest of the beach, particularly on the windward side, surrounding a central depression.

As can be seen from the area figures, most of the islands are small. Christmas Island is the exception, being three times as large as all of the others combined.

It is not the size of the island, however, that determines its suitability as a place on which man can live. This is governed largely by the rainfall, which in turn influences the vegetation and other environmental factors. Most of the other factors of the climate are very uniform. Located within the tropics, and lacking elevation, the temperature never becomes cold. Being surrounded by great expanses of ocean, and with trade winds the rule, the temperature never becomes very hot. In this equatorial belt, air expands, rises, and allows denser, cooler air to move in from north and south to take its place. The rotation of the earth from west to east makes the air appear to drift westward, giving rise to trade winds.

Rainfall is not uniform in the Pacific. There are definite wet and dry zones. Average annual rainfall at sea level may vary from less than 30 inches to more than 160 inches a year. There are pronounced seasonal differences of rainfall on many islands; also there are great variations from year to year. Stretching across this portion of the Equatorial Pacific are alternating wet and dry bands. To cite the more obvious of these, there is a wet zone through Palmyra, Washington, and Fanning Islands, which lie from three to six degrees north of the equator. A "dry" zone extends along the equator and a little to the south of it. In this zone lie Jarvis, Malden, Starbuck, Howland, Baker, and the northern part of the Phoenix Islands. Christmas Island is located between the wet and the dry zones noted above. It is drier than Fanning, but not so dry as Jarvis and Malden. South of the equatorial dry zone the rainfall may increase, so that the southern islands of the Phoenix group might be fit for human habitation some years; but other years might be "dry." Then the coconut palms and cultivated gardens would cease to produce food crops.

Rainfall is by all odds the most variable factor in the climate on these equatorial islands. It not only varies from zone to zone, but also from year to year. Rainfall records for these islands have not been kept for very many years. Two of the longer records come from Fanning, where there was a cable station, and Malden, where guano was dug for many years. On Fanning, the annual recorded rainfall has varied from 47.4 inches to 208.8 inches. On Malden the range for different years has been from 3.94 inches to 93.59 inches. In more recent years there have been records from Canton Island which range from less than 8 inches during the year 1954 to almost 70 inches during 1958, and 112 inches in 1941. During a dry year an average of as little as two-thirds of an inch of rain fell in a month, and the plants dried up. In a wet year, with ten to fourteen times as much rainfall, a comparatively luxurious vegetation made its appearance, followed closely by insect life, including even butterflies. About 100 different species of insects have been collected on Canton Island. Some of these doubtless reached Canton on ships and airplanes; but other species, which live in association with plants which grow on the island, must have arrived under their own power. In another part of this account is given a tabulation of the principal kinds of plants found on these equatorial islands.

The five islands--Jarvis, Howland, Baker, Canton, and Enderbury, with which this story is mainly concerned--all lie in "dry" zones, so it will be their environment--plants, animals, and relationship to man's existence--that we will try to describe. However, by way of contrast, we will also note conditions on Palmyra Island, a very wet island, at which some of the cruises stopped. All of these notes concerning the islands, their plants, birds, mammals, reptiles, fishes, crustaceans and mollusks, will be in Chapter 11.

Jarvis, Howland, and Baker are of the driest type. They support only grass, herbs, vines, and low shrubs. On Howland there were the remains of a few small clumps of kou trees (Cordia subcordata), which appeared to be more dead than alive. This kind of tree grows better on Enderbury and Canton, where were also found the tree

heliotrope (Messerschmidia argentea) and a few planted coconut palms. After the development of the airport on Canton, numerous herbs, shrubs and trees were introduced and cultivated, to make the small population feel more at home.

The most conspicuous animals seen on Central Pacific atolls and sand islands are the birds. All of them are either sea or migratory species. Mammals are represented by rats. There are at least two species of lizards. Sea turtles come ashore at times to lay their eggs. There are a number of kinds of fishes along the reefs and off shore. Spiny lobsters are numerous; also good eating. Hermit crabs are found on land. Collecting mollusks became a fascinating hobby for many of the "colonists," and a list of the principal species will be given in Chapter 10.

3. SHIPS AND TRIPS, 1935 TO 1942

There were in all 26 trips made by U. S. Coast Guard cutters to the five islands in the equatorial Pacific occupied by "colonists." Some of these were of major historical importance. Some were routine supply trips. Two were emergency visits, made necessary by sickness. Omitting these last two, the other 24 of the round trips from Honolulu to the islands and return have been called "cruises" and have been given consecutive numbers, by which they are known officially and in published accounts. The object of this chapter is briefly to summarize these trips, where and when they went, and to describe events of special importance. In Chapter 12 summary charts are given which list the names of the "colonists" and the members of the official parties. This will obviate the necessity of discussing them here. An intimate diary of Cruise 4 to Samoa, written by James Carroll, appears in Chapter 7; and detailed accounts of Cruises 11 and 13, which visited the greatest number of islands, are given in Chapter 9. Excerpts from the diaries of Abraham Pitanaia and Killarney Opiopio, concerning the month they spent on Swains Island, appear in Chapter 8.

The cruises fall into two natural periods: The first four were made under the auspices of the U. S. Department of Commerce. They received a minimum of publicity. The "colonists" lived in very temporary camps, chiefly in tents, with no radio communication, and very few comforts or facilities, on three islands: Jarvis, Howland and Baker. At the end of the fourth cruise all parties were withdrawn.

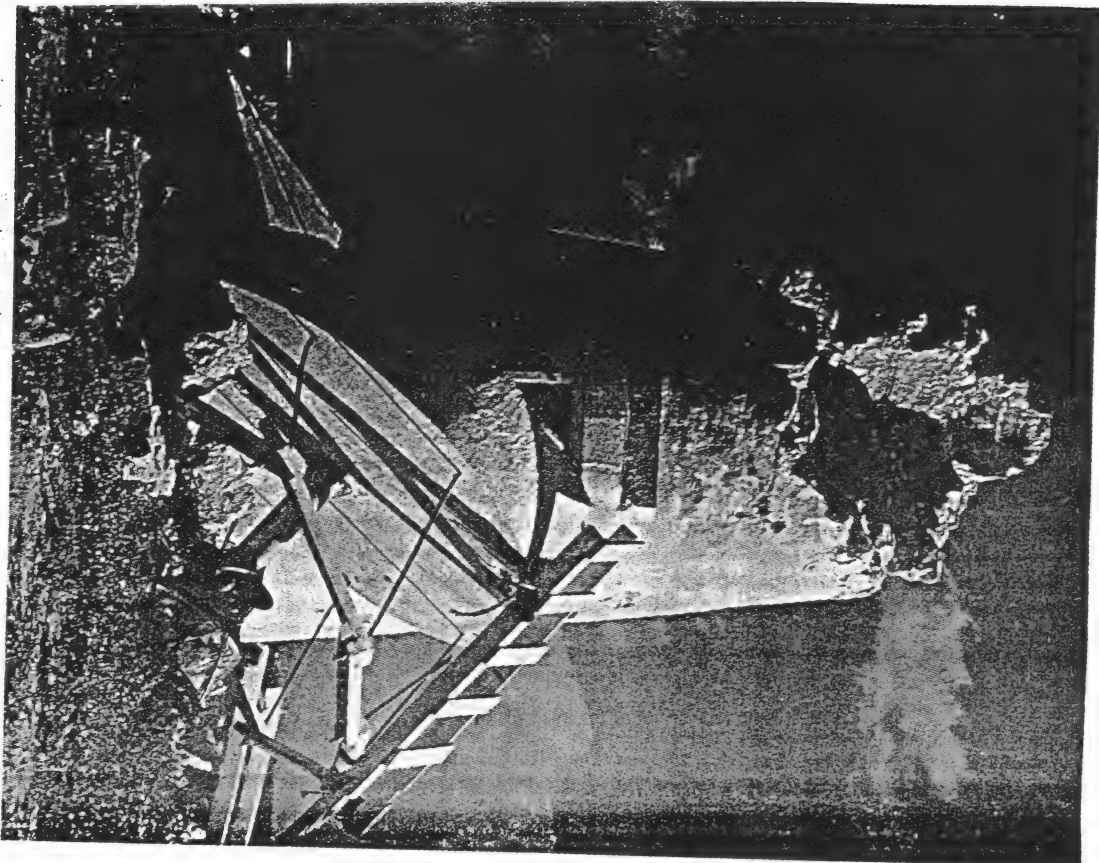
The balance of the cruises (numbers 5 to 24 and the two emergency trips) fall into the second period. They were made under the auspices of the U. S. Department of the Interior. Five islands were occupied: Jarvis, Howland, Baker, Canton and Enderbury. Two of the cruises visited several additional islands (see Chapter 9). The camps were of a more permanent type, including frame houses containing better furniture, refrigeration, water tanks, and radio communications. Except in the case of Cruise 5, when the

4. JARVIS ISLAND AND THE "AMARANTH"

Jarvis had the distinction of being the first of the islands "colonized" during this period, on March 25, 1935. It also had other features which made it distinctive. Foremost of these in influencing the daily lives of the "colonists," and giving Millersville a distinctive architecture, was the wreck of the "Amaranth." The distance from the camp to the wreck, in a straight line, was three quarters of a nautical mile. One round trip measured 1.73 statute miles of travel. It would require an adding machine to measure the total distance traversed by the colonists during just their first year on the island, to procure lumber for constructing shacks, furniture, a raft, surfboards, an outdoor gymnasium, and other items. Austin Collins, leader of the initial party, set the pattern by building the first wooden house. It became fashionable to construct others and to make improvements.

What was the "Amaranth" and when was it wrecked? The most detailed account was written by George N. West in the Honolulu Advertiser for December 22, 1946. George first became interested in the history of the shipwreck when he was a colonist on Jarvis from June 15 to September 14, 1935. One of his duties during this period was to keep the "log" of the party. This series of journals contains a day by day, intimate account of all happenings, and many of the thoughts of the little group, most of them Kamehameha School boys. After his return to Honolulu, George set about learning all he could concerning the "Amaranth."

He learned that it had left Newcastle, New South Wales, Australia, on August 3, 1913, with a cargo of coal, 1,800 tons, for San Francisco. On board were Captain C. W. Neilsen, his wife, their baby boy, and the officers and crew of twelve. The cabin boy, George Vining, age 19, of Santa Rosa, California, furnished many details of the incident, when the survivors passed through Honolulu the following October.



Amelle Earhart Light (lighthouse), Howland Island, after Japanese bombardment of December 18, 1941.

On the night of August 30, 1913, at three minutes past eight, the "Amaranth" was running northeast under full sail, in slightly foggy weather. Suddenly it struck the reef on the southwest side of Jarvis and heeled over. There was no surf or other sign of land. Captain Neilsen immediately ordered the crew to take to the boats. They stood by all night, and the next morning a landing was made on the opposite side of the island. There were remains of old buildings and a few graves, but no sign of life or useful vegetation. As the party landed, staring them in the face was a sign which Vining said seemed ludicrous even to the wrecked seamen. It said: "This island is leased by His Britannic Majesty King George V to the Pacific Phosphate Company of London and Melbourne. All trespassers will be prosecuted under English rules."

Vining went on to say that the vessel broke up rapidly. Water and provisions were obtained from the poop, the only part exposed, and it was decided to proceed south to Samoa in two boats.

The Captain's boat held nine persons, including Mrs. Neilsen and her 18-month-old boy. The other boat, commanded by First Officer A. M. Johnson, held six people. They set out from Jarvis on the morning of September 1. Each rigged a jury mast, made of oars, and set sail for Samoa, 1400 miles away. The second day out they parted company. Vining, in the Captain's boat, stated that after ten days they reached Danger Island, where they were treated kindly by the Polynesian inhabitants. As no steamers touched there, they sailed on and four days later reached Pago Pago. Here, Vining said, they received a minimum of kind attention. They were put up in natives' barracks. However, sailors of the U. S. Gunboat "Princeton," stationed there, gave them some clean clothes to wear. That ship went to sea to look for the other boat and found it at Apia on September 24. Although they had run out of water, all were well. The entire party was sent by way of Honolulu on the S. S. "Ventura" to San Francisco.

Regarding the boat trip, Vining stated at Honolulu that scurvy had made its appearance among them in a mild form. But despite the long dreary days and nights without

seeing a sail, and with occasional buffeting by winds and rough seas, Mrs. Neilsen and her child had remained cheerful. "The baby had been a wonderful kid, ready to laugh and crow at all times. He had kept all of us in good humor."

George West's article remarked: "To the colonists... the remains of the 'Amaranth' proved a blessing. Its lumber was salvaged and provided shelter, comfort, recreation, and a means to obtain food from the sea. The settlers built shacks which enabled them to move from the shelter of the tents; beds, surfboards, and a raft from which to fish off the reef."

Details concerning the history and geography of Jarvis, together with the names of all persons concerned and an abridged log are given in the "Technical Supplement," later in this book. The following are a few excerpts from the "log" which was kept by the colonists during the first year.

Landing was accomplished at a small break in the fringing reef on the northwest side, on the morning of March 26, 1913, just below a four-sided, triangular beacon. Three tents were set up in a depression between two mounds of low-grade guano, behind the beach crest, about 200 feet southward from the beacon. This spot was chosen because of its protection from the wind and proximity to the landing place. Sailors from the Itasca brought our supplies and equipment ashore and piled it on the beach above the high water line. We carried it up to the beacon for safekeeping. Meyer and Bryan put their cots beneath the beacon. At about 2:15 A. M. there was a racket from there as they tried to catch Polynesian rats in an insect net. These rats are so small that they were called "mice" by the colonists.

The last of our water and supplies were landed this morning and the sailors are looking over the island. Collins made a flag pole and attached it to the top of the beacon. At 1:25 P. M. the American flag was hoisted by Collins and Ahia while Aune, Toomey, and Graf stood at attention, and members of the official party watched the ceremony. Mr. Kline assisted Collins and Ahia in setting up the meteorological

instruments. Collins fixed a box desk for reading and recording them. We lunched on fresh fish which Toomey had speared. Fish are plentiful around the island in shallow water. We pitched a fourth tent to use as a kitchen. Collins and the Hawaiian boys went to the wreck to get some lumber.

The Itasca left at about 2:30 P. M. and headed for Baker Island.

Next morning (March 27) we rolled seven of the 15 drums of water up to the beacon. On another trip to the wreck to get lumber we found some money: German 10 pfennig dated 1875; Canadian 10 cent piece, 1902; Mexican 20 centavos, 1907; American Lincoln penny, 1910; a Hawaiian half dollar, 1883; and a Chile peso, 1893. We also found some dishes.

March 28. Collins built a wooden table on which to draw maps of the island, showing where the airfield could be placed. Measurements by him and Ahia showed that Jarvis measures 1.90 miles N. E. to S. W. by 1 mile and 200 yards wide. Aune took charge of the cooking. Graf cares for the medical supplies and keeps the log. Ahia and Toomey specialize in catching fish and spiny lobsters. All five worked as a team. A rain squall drifted across the island and a gallon of water was caught. Following the rain they planted five sprouted coconuts along the north edge of camp.

During the days that followed, Collins plotted a good location for a landing field on the northeast side of the island, about 1,240 by 1,000 yards. The distance between camp and the east end of the island was measured, 2,400 yards.

March 30. It was noted that for the second time since their arrival rain clouds were seen to approach the island from the NE and break up off shore. Parts of the storm seemed to go each way around the ends of the island. "So far we have noticed no mosquitoes or house flies."

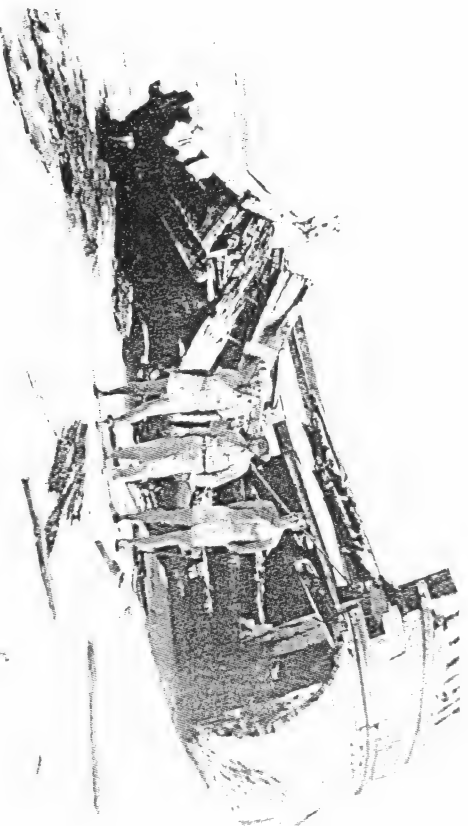
Sunday, March 31, brought us a fairly heavy rain with a SE wind varying from 18 to 24 miles per hour. Our tent fly blew down, but the storm brought us about 15 gallons



Sgt. Collins kept his Jarvis pioneers physically fit with an outdoor gymnasium, built with materials from the wreck of the Amaranth.



The first camp on Jarvis, 1935.



Expedition members visit the wreck of the Amaranth on Jarvis, 1935.

of water. Ahia planted cabbage, radish, onion, celery, and lettuce seeds on the side of the guano ridge. Ahia's and Toomey's electric lights from batteries seem to draw more moths and other insects than the lantern does, at least they bother us more. Graf catches specimens for Bishop Museum. He noted that the most abundant insect in the tents was a "beetle-fly", they are attracted by lights, get into bunks; sleep on the tent ceiling, and are a general nuisance. They do not bite, but their crawling in bed gives an uncomfortable feeling. [This has been identified as an Oedemerid beetle, Ananca bicolor, with slender, deep purplish-black elytra and a pale orange prothorax "collar."]

What we call "field mice" [small Polynesian rats] by the dozen crawl over the beds during the night and sometimes get between the blankets. Our sleeping is done on portable camp cots, made of canvas over a collapsible frame. We use khaki wool blankets with no pillow or mattress. Each has sufficient bedding to suit his own idea of comfort. Some use two blankets under and two over, with one for a pillow. The nights are quite cool.

Breakfast usually about 7:00; a mainstay, since we eat but two meals a day. Toomey and Ahia like the water and supply us with marine food, both fish and lobsters. Each of them lends a hand with the cooking, water carrying and general camp duties. Ahia is greatly interested in plant and insect life and does some collecting. During any time of day one or two or more may be found here or there on the island, at the shipwreck, fishing from the boat or what-not. At noon we may gather at the kitchen tent and eat a can of sauce or fruit together. No cooking is done at that time. The evening meal is eaten between 6:30 and 7:30. After that we talk, tell stories, play cards or checkers, practice on the mouth-organ, or sometimes catch insects around the light. We are building paths to improve the appearance of the camp. We have found farming in any form out of the question. The coconuts are making no progress. Planted garden seeds are eaten by the "mice." Everything dries up between showers and we can't spare fresh water.

On April 11 there is the entry: We have all become interested in sporting events, and at about 9 o'clock we held a meet: shot-put, standing and running broad jump, high jump and ball throwing. Then we go swimming, or across to the shipwreck to fish.

On April 13, Ahia noticed that the boat was missing. It had broken away, apparently as the result of an exceptionally high tide. We did not see it again.

On April 18, while cooking breakfast the oil stove caught fire. Graf dragged it out of the tent and put a wet blanket over it; but the stove was damaged beyond use. Work began immediately on a fireplace a few feet southwest of the kitchen tent. Breakfast was delayed, but not for long.

April 19. Conditions around camp are getting better day by day. New refuse pits have been dug. Collins got more lumber at the shipwreck and built a table for use in the kitchen. Aune likes the new stove better than the old one that burned oil. The path from the beach to the beacon is about 5 feet wide and is covered by four inches of coarse sand. We now have two roads into camp, one past the beacon and one direct from the beach, along the old guano tracks left by the guano diggers.

April 22. When raising the flag at 5:35 A.M., Collins, Toomey and Ahia sighted a white ship about 8,000 yards off the west coast. At about 6:30 A.M. the Itasca was off the landing. The official party and several of the crew came ashore. They inspected the camp and seemed highly pleased. The landing boats made three trips and brought ashore additional water and supplies. Graf went on board to get a few needed items. The stay of the visitors was brief and by 9:00 A.M. the ship was under way, making a circuit of the island. Aune and Toomey spent the remainder of the day making shelves and arranging the new supplies. Mr. Griffin was very thoughtful in his selection of additional foods, and items which we had been thinking of were included. Fresh fruit and real crackers were novelties on our supper table. Coconuts from Samoa were planted around camp, each of us trying our luck at getting a tree started. This ended our fourth week on Jarvis.

April 25. Following breakfast, Collins set out to do some more measuring and staking out of rock piles and ridges on his map. Ahia is also making a map of Jarvis. A supper of sweet potatoes, cabbage slaw, pea soup, wieners, crackers, jam and other nicknacks was highly enjoyed.

April 26. A map-making routine seems to have developed among the group. Angles, degrees and dimensions are the topic of the day. Graf continues to collect shells.

April 29. The first thing this morning a bos'n bird was found making its nest at the beacon, right where it is necessary to stand for reading the thermometer. The bird fussed some each time someone came near, but continued to hang around. It refused to eat bacon scraps. Finally, after several hourly disturbances, the bird decided it would nest elsewhere and flew away. Food inventory was taken today. Collins is starting work on his fourth map of the island. He has also started digging just southwest of camp to determine the depth at which water can be struck. The water from Samoa was not considered as good to drink as that from Honolulu.

April 30. Toomey, Collins and Aune had a close call with a shark while swimming at the landing place. Ahia and Graf caught about 50 whole fish and saved the largest for eating. In the afternoon Collins visited the shipwreck to get lumber for a sketching board. In the evening he picked his way through about two feet of solid rock in the water hole. He carries out a schedule of mapping each day and also spends about an hour working in the new water hole.

May 3. While helping Aune get supper, Toomey spilled some hot cooking oil and burned his legs and feet. Through prompt treatment, although huge blisters formed, they were nearly healed in about three weeks.

May 7. The airfield is completely staked out.

May 8. A brick oven, started by Collins and Aune, has been improved with empty kerosene cans for either cooking or baking. It adjoins the previous fireplace.

May 9. Collins and Graf went to the shipwreck to collect insect and marine specimens. They brought back a black, yellow-edged eel, a small crab, lobster, jellyfish, worms, sponge and seaweed.

May 10. Work on the new waterhole has been discontinued because of cave-in possibilities. A depth of nearly 12 feet was reached. It will be used for garbage.

May 12. Collins plans building a cabin or house, using the fly tent, which was pitched on the beach, as a roof. He repaired a chair which he had brought from the shipwreck. He made several trips and has a framework set up.

May 17. Ahia caught a grayish, brown-speckled eel, too large to be kept. Sharks are plentiful toward the N. E. end of the island, and rather bold and curious.

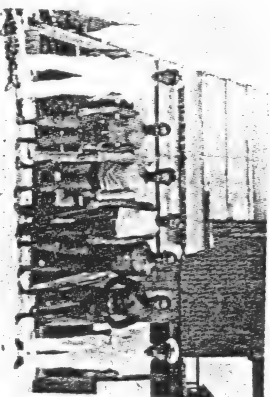
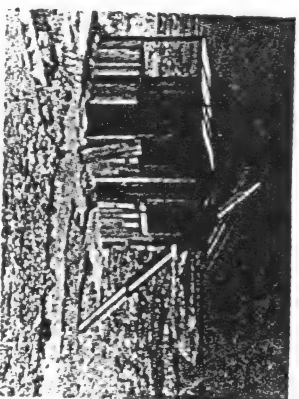
May 18. Collins put the fly, from the beach, as the roof of his house. He carried gravel for the floor, and has the outside banked with a foot or two of rock.

May 19. Another Sunday ends our eighth week on the island. Collins put a few finishing touches on his house and declares it complete after one week of work. There has been more than the usual amount of rain the past few days. The moisture is giving the radishes a "boost." Another dozen or so plants broke through the ground and look healthy. Coconut plants, 14 in all, retain a partial greenness. During the recent moderate rains it was noticed that the ground in the central section of Jarvis becomes marshy and boggy, but it dries quickly. In places it cracks and cakes.

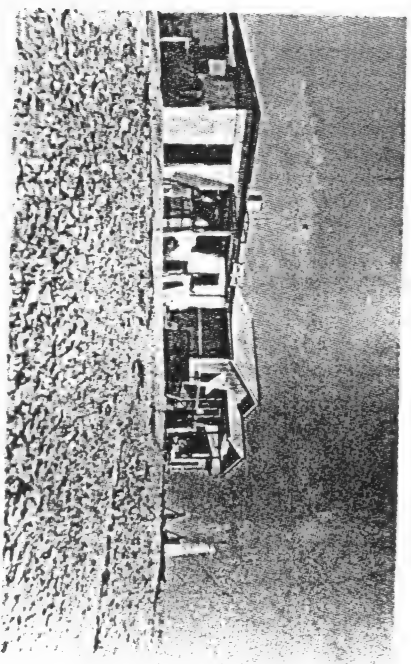
May 20. Ahia substituted for Anne as cook, starting with eggless hotcakes. Collins and Ahia moved into the new house. Toomey and Graf occupy the Headquarters tent vacated by them.

May 21 was spent in routine exercising, swimming and reading. Toomey's foot nearly healed but it bothers him to walk on it. Several zinnia and lettuce seeds had sprouted as a result of last week's rain, and a few peanut plants are well above ground.

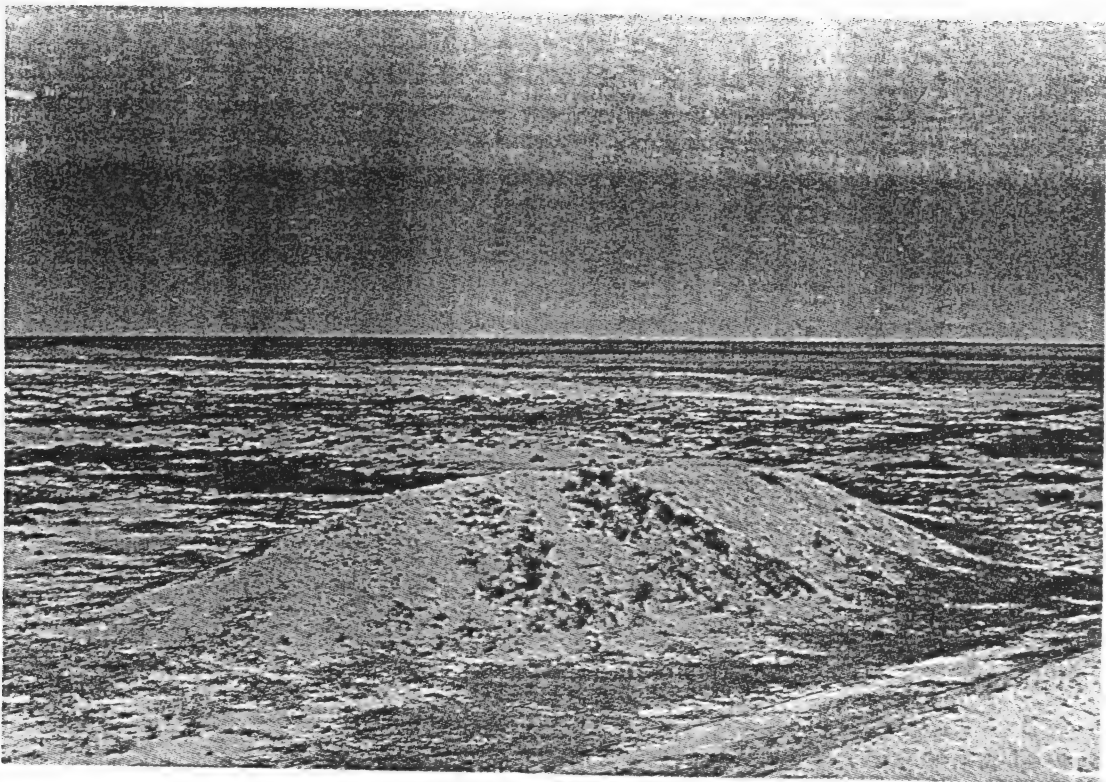
Sgt. Collins built himself an "office" on Jarvis, 1935, from material from the wreck of the Amaranth.



Jarvis Island was recolonized, June 19, 1936. Sgt. Collins installs Henry Ahia, Hartwell Blake, George Kahana, and Frederick Lee, flanked by officers of the U. S. C. G. Tiger, Cruise 5B.



Jarvis Island camp and beacon, August 18, 1936.



Looking across the "basin" of Jarvis Island from near camp. The mound in the foreground is low-grade guano, dumped from a tram car and never shipped.

May 24. Toomey welcomed back into routine activity. Collins, Toomey and Ahia fished at the landing and caught a good sized red snapper. May 28, Toomey and Graf caught a few lobsters right after breakfast. May 29, Ahia had good success baking in an improvised oven. He strives for variety and tries many new things. We relish his baked dishes. He and Aune worked together last evening on "peach cobbler." Supper, June 4-- pea soup, tomatoes, fried fish, boiled squid, navy beans, sauerkraut, called a "meal fit for a king."

June 6. Collins started the day with a trip to the shipwreck in quest of a canvas to patch his cabin and keep the rain out. Zinnia plants continue to grow. Aune transplanted some pickleweed (*Sesuvium*) to use as a hedge. The log records numerous collecting trips and catching fish. June 11 the Hawaiian boys observed King Kamehameha Day.

June 15. The Itasca was sighted to the north and soon arrived off the landing. This ends the log as kept by Graf. It was continued by George West. Those in the first landing party were W. T. Miller, H. A. Meyer, Commander Derby and his aide. Collins, Graf and Aune went aboard to return to Hawaii. Henry Ahia and Dan Toomey elected to remain and were joined by George West and Frank Cockett. Mr. Albert Judd, Donald Mitchell, Mr. Meredith and the crew of the Itasca came ashore for a visit. Fresh supplies were landed; also 15 new drums of water. Unloading was completed by 1:30 P. M.; many of the visiting party had lunch on Jarvis. We had a serious talk with Lt. Meyer regarding our food supply, water and duties. By 4:15 P. M. all of the visitors were in the boats ready to go aboard the Itasca. The particular handshake of Mr. Judd and the tone of his words were so sincere and well meaning that they touched us all. We would all make good for Kamehameha (Schools) and all other Hawaiians.

The ship left at 4:45 P. M. Henry [Ahia] then talked to us regarding the importance of our duties, and our situation for the next three months. He and Dan gave us a few pointers about the weather instruments, how to read them and record the readings. At supper, on each side of the kitchen table sat Henry Ahia, Dan Toomey, Frank Cockett, and

George West, residents supreme of Jarvis Island, U.S.A. In the midst of our supper we remembered that we had forgotten to lower the flag, so we rushed out and did so in true American style.

June 16. We spent all morning putting the cottage and tents in order. While taking an evening swim, Henry caught a shark, one of several close to shore. All this, the beautiful sunset, seeing "mice" running in all directions during supper, were experiences new to Frank and George. We have a little mascot, a baby frigate bird; this was its second day with us, and very much alive. Our supply of apples and oranges is beginning to spoil, so we are consuming them as fast as we can.

June 17. Frank, Dan and Henry hauled up three drums of water. Frank and Dan caught aholehole fish for the little mascot. We made a close written account of all our rations and arranged the supplies. In the late afternoon we hauled up four more drums of water. The coconuts are doing well; even radishes and flowers are coming up slowly. We opened the Bishop Museum collecting box and arranged its contents for instant use.

June 19. Pancakes were served for breakfast. Dan caught small fishes for the little frigate bird. He caught one fish we didn't know and saved it as a specimen. Henry clipped the hair of George and Frank. A ukulele and books of Hawaiian songs by Charles King and Johnny Noble were additions to our entertainment. The remaining four drums of water were hauled up. June 20 Dan made a portable lighting system.

June 21. Visited the shipwreck. Frank and George were impressed. Caught 18 fish and a lobster. Raw fish and poi made up our noon meal. We had a short rainfall at dusk with heavy raindrops. Fried fish for dinner. We learned that hermit crabs feed on "mice."

June 23, Sunday. Everyone seemed quiet and solemn all day, with devotions in the evening. Frank Cockett was startled by a large bird inside the beacon, which he thought at first was a bat.

June 24. We made boxes into which various types of soil would be placed in which to plant seeds. The soil was collected in barren land in the easternmost part of the island; also some from guano diggings and nearby mounds. There are only four packages of seeds: phlox, marigold, lettuce and radish. The weather instruments are not giving us logical readings. The anemometer was cleaned and oiled according to instructions.

June 25. Bag coverings were made for our sand boxes. White beans, brought from Honolulu, were planted after a night's soaking. The coconuts were cultivated again. The weather instruments are now operating satisfactorily. Frank and Daniel caught a red snapper and made a delicious chowder. Our little frigate bird, which we named Sailor Boy, died early this morning. It was probably too young to be taken away from its mother.

June 26. At 2:45 this morning we had the heaviest rain since June 15. Two kites were made to learn how the birds on the island would react to them. One was tied to a pole at the shipwreck. Many birds flew around the kite but did not attack it. Dan flew his kite after lunch. Again the birds only showed their curiosity. We are taking daily physical exercise in the evenings in a miniature outdoor gym. The "mice" on the island are a menace to our gardens.

June 27. We made a shell-hunting trip around the island. Shells were scarce and hard to find. We stopped at one place to watch the sharks swimming around in water so shallow that it amazed us. We watered the gardens in the evening.

June 28. Frank and Dan went fishing. Henry inspected the landing field site. Several little mounds needed to be leveled and a few holes filled. The beans we planted on the 25th are beginning to sprout. July 29. We are learning to play the ukulele and also to fly kites. The phlox seeds which we planted are growing.

June 30, Sunday. No church to go to, but we held our period of reverence. Wind and rain at 4:45 P.M.

Several things had to be moved around to be protected. It poured at intervals all through the night. The white beans have sprouted more than an inch above the soil.

July 1. New camp activities: Dan Toomey and Frank are the new cooks; Henry gathers firewood; George enters the day's events in the log, prepares menus, and helps Henry. A weekly check of rations was made. Ocean water, for washing, was stored in a container by George. Dan Toomey recharged batteries. A bad squall this morning from 10:26 to 10:29; a sudden gust of wind and a heavy down-pour. Henry and George spent the afternoon filling holes in the airfield.

July 2. Frank and Dan caught three good fish, two of them strange to us. One is black and red like a kolo. They had an encounter with a large shark. Seeds were sprouting and look healthy. We ascertained the time of sunrise and sunset from the World Almanac to check on our time.

July 3. We are building a wooden bed to accommodate more than two persons to use as a couch. Frank, Dan and George brought a broken door and pieces of lumber from the shipwreck. At nightfall we laid our mattresses on this punee and all four of us initiated it. We also discussed building a raft and enlarging the cottage. Our log shows that a drum of water lasted two weeks. Daily exercises at sunset.

July 4th was observed by flying the flag, having biscuits for breakfast, and ending the day with chicken noodles. July 5 Henry spent the morning shell hunting. During his trip he saw some turtles on the westernmost side of the island. Dan and Frank spent the morning fishing, catching 'o'o and uhu. George collected insects.

July 6. Frank, Dan and Henry went in search of suitable lumber for a raft. Not having the necessary tools, they collected shells instead and again sighted turtles. Our farming project is beginning to look discouraging; the plants are drying out.

July 8. We started building our raft; 8 feet square, made of four logs with an empty drum at each corner. We will use it for fishing off the channel where it will be possible to catch larger fish without danger from sharks. July 9 Henry and George went to the shipwreck for more lumber. July 10. We started enlarging the cottage, begun by Frank and Henry, because of the kinds of lumber found, instead of finishing the raft. The walls facing the west were knocked down and the side walls extended 12 feet. The roof was not completed because of lack of lumber. A gorgeous sunset, the sky almost completely orange color. The sun's rays shone through cumulous clouds, with the half moon in a blue area overhead.

July 11. The lumber business reached its peak: lumber was brought to camp all morning, with backs bent and shoulders burning. We put new pieces of tin on the table legs to keep the "mice" from climbing to the top. In the afternoon we finished the roof.

July 12. Last night there was a heavy rainfall, heaviest about 12:10 A.M. Another severe rainstorm at 7:25 P.M. Heavy wind knocked down the kitchen tent, breaking tent pegs. July 13, after drying and setting up the kitchen tent, we spent the day working on the cottage. We patched the roof with canvas and softened candles. July 14. There is now a lake in the center of the island caused by heavy rains. We saw a very bright meteor at supertime.

July 15. Seeing large fins, Frank and George drifted out on the raft to try to catch sharks. The fins turned out to be the curving ends of an enormous sting ray. It swam around the raft and caused a whirlpool. It had a black body and was shaped like an enormous bat. We decided that what we had thought to be dolphins were sting rays. The Hawaiians call them hihi-manu. Fin tips may rise 5 feet above the water.

July 16. At last we have moved into the cottage. It has a lanai on which we can enjoy eating meals. Now we are making cupboards, shelves, magazine stands, and a lighting system. We made a new cooking table and safe for dishes and silver. We can see the ocean while we eat. We knew by

the World Almanac that the moon would be full. It rose over the eastern horizon as we cooked and dined. The tide was low tonight and the reef within sight was almost dry.

July 17. Henry fixed a chair, made braces for the cooking table, and patched a hole in the canvas. Dan worked all day, cleaning the shells he had collected last night. Frank repaired his flashlight. George prepared menus, made corrections in the ration account, and tried to catch up with his diary.

July 18. This evening it was nice and cool. The wet and dry thermometers read 77 and 73 degrees respectively, unusually low readings. The lowest wind velocity was at 3:00 A.M., 3 miles. In the evening Frank and Dan went hunting on the reef. They found a number of shells and a large lobster, which they cooked.

July 20. Henry and George made a profitable trip around the island, studying birds, insects and plant life. They saw a small flock of "quail" [some species of migratory bird]. They have long legs and are smaller than a love bird. We saw them on the northeast end of the island. Love birds are found in the easternmost part of Jarvis. One never tires of rambling among them; thousands of them fly low over you with shrill cries. [These observations may include other species of terns.] We came to a place where there were lots of holes. We found a bird in one of them. It was about the size of a love bird, but the bill bent down at the tip. [A petrel or shearwater.]

July 21. Today is our fifth Sunday on the island. We are all well and nothing serious has happened to us. None of us is homesick, but we do miss a lot of things.

July 22. Our raft was finally completed by Dan and Frank. Stray lumber from the shipwreck was used to make a platform. In its center a hole was left for fishing purposes. We plan to whitewash the cottage and the beacon. Henry got some lime from the airfield, mixed it and spent the day whitewashing the cottage. George carried bricks for the roadway around the camp. He and Henry spent much time washing and scraping the concrete off the bricks.

July 23. Henry made a table on which to skin birds. He also made an experimental aquarium. He put in it some aholehole, with seaweeds and coral, but they all died. Yesterday, when Henry went to get lime he found a partly dug grave, which looked as if it had been dug some years ago. Nearby were some human bones. In the evening Dan and Frank went torch fishing. They came back with 'o'o fishes, lobsters and two stick fishes. They made their torches from 1-1/2 inch pipe which they found at the shipwreck.

July 24. Since the heavy rain of July 12, we have not had noticeable rain. The "mice" don't trouble us so much here as they did at the old place. There, during suppertime, they would run around in countless numbers.

July 25. Ever since we started having pancakes for breakfast every morning a competition has been on. Everyone has tried to claim the title of champion pancake eater. This morning we ate the best pancakes ever cooked on the island, made by Dan. Dan and Frank went torching again after supper. They caught 26 lobsters and several fish, and had a further encounter with sharks. It rained disgustingly toward midnight, and our roof leaked so badly that we had to move our beds down to the tents for the rest of the night.

July 26. Our cottage was in total disorder this morning due to the rain. The fish lasted us all day. They were the best eating fish we had ever had. We also cooked the lobster, some boiled, some made into soup. One of the fish is called po'o-pa'a; it is dotted all over the body with red, black and yellow. Another specimen, about the size of a human hand, has a flat body, protruding eyes, short legs and feelers. Its color is light red.

July 27. Dan and Frank hiked halfway around the island. They noted seeing eels that ate crabs. One rose up like a rattlesnake ready to strike. At lunch time we saw several porpoises leaping out of the ocean, six or more abreast, and also following the leader. We had hot-cross buns with sausage inside for supper, made by Dan. A bug crawled into George's ear and made him feel very uncomfortable. We flushed the ear with coconut oil and warm water.

July 28. It rained this morning at dawn and drizzled for quite a while. Held Sunday services. Fish at each meal. George's ear has not bothered him today, although he believes that the bug is still inside.

July 29. It rained again this morning. At 11:45 it poured. Henry went to the shipwreck for long poles to hold up the corners of the canvas. Dan repaired the roof. Frank and George came across a mound of bricks. July 30. We went out fishing for the first time from the raft, and stayed out for nearly five hours.

July 31. We took a monthly inventory of ourselves: Physical condition good. We live in a spacious cottage made from pieces of a shipwreck. Air and sunlight abundant; ventilation perfect. Nights are cool. Everyone feels fine each morning. The dining room, parlor and bedroom are under the same roof. The dining room extends onto the lanai. During meals the whole expanse of the ocean can be seen. The kitchen is out of doors. The stove is a few feet away from the cooking table. The garbage cans, piles of firewood, etc. are handy and arranged systematically. We ran out of potatoes two weeks ago. Onions will be used up in two or three days. One can of ham has spoiled. We have enough poi for the month of August. Rice will last two weeks more. We have half a bag of sugar and enough cream to last until the end of August. We have lots of corn, peas, and corned beef, sausages will be exhausted soon, and so will peaches and pineapples. Canned apples are good for weeks to come. Kerosene and water will last for months. There should be a ship on the horizon soon. A chop sui dinner will be given to the first to sight it.

August 6. There was a change in the way dawn appeared this morning. The sea was calm, glassy. Out on the ocean white flashed--fishes leaping and breaking the smooth surface. Booby birds skimmed the surface, catching fish. Some would fly high, nose dive, scoop up the fish and fly away. The calmness of the sea made these antics easy to watch. Toward sunset the entire ocean within our view from the cottage was covered by porpoises, here and there. They seemed to be passing in review. We estimated seeing as many as 800.

What is a night like on Jarvis? Despite its closeness to the equator, it is not warm or uncomfortable. It is cool and the breeze is soothing. At times two or three blankets are required to keep warm. We watch the phases of the moon and clusters of stars.

A word about the kind of weather reports we make. We record the kinds and amounts of clouds and visibility. We give readings of the wet and dry thermometers. The average velocity of the wind in miles per hour. We measure the amount and duration of rain. The most severe was the rain storm of July 12. At no time has there been thunder or lightning.

Aug. 13. We measured the distance around Jarvis as 5.05 miles, and tried to figure how many yards the .05 represented.

Aug. 14. At 3:50 P.M. it was windy and the sea was choppy. Suddenly there was a cry from Dan Toomey, "Hey, look at the ship out there!" It was about 2 miles off. All four of us ran out of the cottage and climbed the beacon. The ship appeared to be a black tramp freighter. It had a foremast and an aftmast and a smoke stack in between. The build of the ship was rather peculiar. Nothing else was visible except a little structure behind the smokestack. There was no flag flying. They came so close that we thought they would surely land, but instead it slowly drifted away. Its bow was pointed in the direction of Palmyra Island. It was out of sight at 4:45 P.M.

Aug. 15. This evening, beginning at 6:06, occurred a steady downpour of rain which lasted until 6:30. The roof is now almost rain-proof. About 3/4ths of a clean galvanized garbage can was filled with rain water.

Aug. 19. In the afternoon Dan speared four uhu, which we had for dinner. Our raft was washed ashore and is quite a wreck. A bos'n bird laid an egg inside the beacon. This will give us an opportunity to see exactly how long it will take to hatch.

Aug. 21. Henry and George repaired the raft and used it to go fishing. They caught nothing, not even a shark. George spent the afternoon writing about birds, and made trips into the field to verify his descriptions.

Aug. 22. An enormous turtle was captured at 9:00 this morning. About 4:00 this afternoon two turtle tracks were seen on the beach leading up toward the interior. A little later a turtle was seen close to shore, but soon disappeared. We visited the area at 9:00 P.M. and found a third fresh turtle trail. We found the turtle just above the beach crest on the west coast, and captured it. Henry and George also saw a strange bird near the shipwreck. It was about 6 inches long with a wing spread slightly less than a foot; wings and tail brown, with white around the neck, under the body and above the tail. Head and bill, which is an inch and a half long and curved down, are black.

Aug. 23. Today was turtle day on Jarvis. Much difficulty was had in attempting to drive it home from where Henry and George captured it. It was stubborn; it wanted to go inland or back to the beach. At 11:30 it refused to move. It had taken 5 hours and a half to make it move 150 yards in our direction. At 12:00, Henry got a knife and a pan; killed it and brought back a pan full of meat. George and Henry went back for the shell. The turtle meat was good; some was fried. At dinner we had turtle soup. Some of the meat was put out to dry. Dan spent the afternoon cleaning the shell.

Sept. 1. At 7:30 A.M. a two-masted sailing vessel was sighted on the western horizon. Strong winds were blowing and the ship came swiftly to our shores. We knew by the way the vessel moved around, just outside the channel, that it was going to anchor. Some difficulty was had, but finally a rowboat dropped the anchor on the reef. The ship lay less than a quarter of a mile out. When the first landing party came ashore we learned that this ship was the Auxiliary Yacht Kinkajou of Hawaii, bringing another scientific party. Going aboard, we learned that this expedition was headed by Dr. Francis Dana Coman of Johns Hopkins University. We shook hands with Dr. Coman and the skipper, Constantine Flink, and looked over the ship. It had

come from Baker and Howland, and brought all sorts of news. We learned that we were going to have a radio receiver and transmitter on the island. We also learned that the Itasca was to leave Honolulu on September 9. We learned that we were popular people in the feature sections of our home newspapers. There was a pack of letters from home telling us all about the things that were happening. We could imagine how thrilled we were to see these people with all the good news and good things they brought. Dr. Coman was very friendly and told us to write letters home which he would take. We helped with the loading and unloading of the supplies.

Jarvis was a scene of activity. The skipper and crew were busily engaged in putting up the tents and radio poles, moving the provisions and supplies. Dr. Coman was being shown to various points on the island by Henry. He was interested in getting samples of guano. He seemed to have an inexhaustible knowledge of birds. He gave the common and scientific names of all the birds he saw. Dan and one member of the crew went out for lobsters. They were unable to find any, but they caught an enormous number of aholehole. George and Frank helped the crew.

Dr. Coman and the Captain dined with us tonight. Down on the beach Dan, Frank and the crew were cleaning fish by the light of lanterns. The Doctor remarked that we treated him like a hotel did, and he liked the food. The crew also had supper with us and everybody seemed to like the fish and food. Two of the Coman party will remain on Jarvis: they are William Chadwick, the radio man, and Louis Suares, a Kamehameha Schools student. Their camp is situated on the beach crest, about 200 yards from our cottage, right alongside the graveyard. After supper, they all went aboard the Kinkajou, including Dan and George. Staying on Jarvis were Henry, Frank, and Louis Suares. Dan and George chatted with the crew and listened to the radio; they heard stations in New Zealand and on the Pacific coast.

Sept. 2. Dr. Coman, some of the crew, the radio man, Dan and George came ashore at about 9:00 A.M. Dr.

Coman had breakfast with us as did the others who came ashore. He said he never ate better pancakes. After breakfast, Henry escorted Dr. Coman, Chadwick and Suares to various places on the island. They collected guano samples, which Dr. Coman said was a mission of the party now stationed on Jarvis. Dan, Frank and George kept company with the crew who came ashore. The Kinkajou has a small crew: first mate, chief engineer, three sailors and a cook, in addition to the Captain. Later Mr. Chadwick went to work on the radio apparatus, and the rest went swimming. The departure, at 11:30, was hearty. Dr. Coman again expressed his appreciation for what he called hospitality. It took over an hour to get up the anchor and set the sails. The Kinkajou finally got under way at 12:12 P. M. and was out of sight by 2:15. It was going to Christmas Island where it expected to meet the Islander, which was bringing more fuel.

In the afternoon Henry and George helped Mr. Chadwick, who was racing against time to get the radio apparatus hooked up for night traffic. He said he had some important schedules to meet. By dusk everything was completed. Suares had supper with us. We practiced good neighborliness and took food to Chadwick. After supper we all gathered in the radio shack to hear whatever news there was. The schedules did not materialize, but we heard the Islander calling the Kinkajou. Also, Mr. Chadwick contacted KYG, Globe Wireless Co. at Kawaihapai, and KHK at Wahiawa. He relayed two of Dr. Coman's messages. We checked our clocks by time signals from San Francisco Naval Radio, and found them 15 minutes behind.

Sept. 3. For the first time since leaving the Itasca we have eggs to eat: fried eggs for breakfast and some in our pancake dough. Fresh fruits, butter and rice were also received.

We gathered in the "radio shack" tonight, and Bill Chadwick sent messages to our folks at home through an amateur in Honolulu. He also sent an article for publication, written by Dr. Coman. The Itasca was contacted, but Bill was unable to reach Howland Island.

During the two weeks which passed between the arrival of the Kinkajou and that of the Itasca on September 15, a very interesting relationship developed between the personnel of the two camps. Henry Ahia spent many evenings at the "radio shack" with Bill Chadwick. Various messages were transmitted to Honolulu and the Itasca. Louis Suares worked harmoniously with his schoolmates. They fished together, ate many meals together, included him in their work and leisure time activities. The Kinkajou had brought a number of old magazines, which added to their stock of reading material. Frank received word that arrangements for his entrance to the University of Hawaii had been completed, and now he is certain about returning to Honolulu; but Dan and Henry plan to remain on the island. Much time was spent in improving the appearance of the camp. There was considerable heavy rain and drizzle on the 12th. Radio contact was made with Howland and arrangements were made for a radio program from Honolulu on the evening of Sept. 14, with greetings from relatives and friends.

Sept. 15. The Itasca was sighted at 10:27 A. M. and it stopped about 500 yards off shore an hour later. The first landing party consisted of Mr. W. T. Miller, Captain H. A. Meyer, Commander Derby, Sgt. Austin Collins, and Theodore Akana. They were shown our new cottage by Henry Ahia, and commented on improvements since the last visit. Kenneth Bell and Jacob Haili will replace Frank Cockett and George West. George will go to San Jose State College. Henry and Dan will remain for another three months. Mr. Miller gave Henry and Dan permission to go aboard the Itasca for lunch, accompanied by Louis Suares and Bill Chadwick. Parties of the ship's crew came ashore and went immediately to the shipwreck to collect souvenirs. Others helped to unload supplies and water drums. Captain Meyer (promoted since his previous visit to Jarvis) talked with Henry Ahia regarding our food and water supply, health and other things of importance. Unloading of supplies and water was completed by 3:30 P. M., and all of the "Colonists" came ashore for a visit, to exchange news and admire the island. They returned to the Itasca at 4:00 P. M. The storing of our food supplies commenced immediately, and it was all safe within the shelter of the ration tent before sundown.

Sept. 17. Jacob and Kenneth made a trip to the shipwreck before breakfast. Much of the day was spent checking the inventory list. Henry and Kenneth went spear fishing with Bill Chadwick. The large mullet they caught had worms in its flesh and was unfit to eat. Henry and Dan received a radio message from Honolulu that their parents and friends would speak with them on Saturday at 5:00 P. M. via radio-phone, made possible by Kenneth Kum King, radio operator on Howland with the Coman Expedition.

Sept. 18. A double layer of wax paper was laid on the board roof of the cottage, and a canvas tent fly was put over the paper to hold it down. The evening centered around new musical instruments--guitar, ukulele and harmonica, with singing.

Sept. 19. Just before lunch, two large fish were noticed swimming around the bathing place. They were not sharks but were believed to be either 'o'io or 'a'awa. Dan's surrounding net was used to capture them, but one broke through the net and got away. The other measured 3-1/2 feet long, 2 feet 4 inches in circumference, and weighed 60 pounds. Some we had for supper, and the rest was dried.

Sept. 20. It was noted that Kenneth and Jacob seem to have adjusted themselves to their surroundings and are fitting into the routine of duty in excellent fashion. The combined members of both camps went spear fishing and caught a variety of fishes. In the evening Henry Ahia heard that Joseph Anakalea and Folinga Fautata were stationed on Howland, replacing William Toomey and William Anahu, who are returning to Kamehameha for their final year of high school.

Sept. 21. At 5:00 P. M. Henry heard his two brothers, Sam and Charles, speak to him over the radiophone; and Dan heard his dad. They told of interesting happenings in Honolulu--football, boat racing, and family news. Sept. 22, Sunday, a "day of rest." Dan, Kenneth and Louis visited the shipwreck to get lumber for surfboards.

Sept. 23. Kenneth, Jacob and Henry worked on leveling the airfield area and began to construct a large

T-shaped marker, 20 x 30 feet to be visible from the air. Sept. 25. Henry and Jacob constructed another marker on the extreme western side of the airfield.

Sept. 26. Kenneth worked on his surfboard, 6-1/2 feet long, the first to be constructed on Jarvis. Dan Toomey worked all day on one 12 feet long. Louis Suares went to the shipwreck for more lumber for his.

Sept. 27. Kenneth Bell caught a "quail" this morning and brought it back to the cottage. He intends to make a pet of it. The bird is quite tame but shy of our presence. We named the bird "Oscar." Henry and Kenneth, with a little scoop net, went into the field to catch love birds for pets. They captured two: one all white, the other lavender in color.

Sept. 28. Kenneth made a trip to the shipwreck before breakfast. He intends to lengthen his surfboard from a 6 footer to nine feet. Dan and Kenneth worked on their surfboards in the morning and went surfing in the afternoon.

Sept. 29, another Sunday. Surf riding in the afternoon. In the evening Henry visited the radio shack and heard a radio program between Honolulu and Howland. Hearing that Dan Toomey's dad wanted to speak to him, Henry raced to the cottage and got the other three. Don Mitchell, of the Kamehameha faculty, and various schoolmates also spoke. The occasion was Dan's 21st birthday.

Sept. 30. Inventory was taken of camp equipment, provisions and water supply. Kenneth Bell constructed dumbbells and bar bells, using old dry cells as weights. He made them of different weights--four to nine cells on each. Gym headquarters are in the camp supply tent. Dan caught a "quail" at 4:45 A. M. He was awakened by the whistling of the bird outside the cottage. Today was Henry Ahia's 23rd birthday.

Oct. 1. Hauled the last two of the 19 drums of water from the beach to the beacon. Oct. 2. Jacob Halli went to the shipwreck and brought back six pieces of lumber to make into a bed, 3 x 6 feet, without legs. Dan and Jacob

began their "body-building" exercises; Henry and Kenneth also did exercises. Henry went to the radio shack and heard some girl friends talk to the boys on Howland.

Oct. 3. After a strenuous day collecting specimens in the field, Henry went to the radio shack and the others organized the "Jarvinia Hot Shot Quartet."

Oct. 4. Jacob Haili worked on a contraption to perfect his "U-ma" ability [hand wrestling]. Dan rigged up a lighting system for reading at night, using five dry cells. Kenneth cleared a path from the beacon to the supply tent and began to draw a map of the island. Henry Ahia has a fine collection of sea shells.

Oct. 6. A large turtle was seen, believed to weigh in excess of 500 pounds. Our friend Oscar has been free to roam the beach, with clipped wings. It visits the cottage regularly for food and water.

Oct. 8. Shell collecting has become the fad of Jarvis. Henry has the largest collection; Dan and Jacob have just started. Kenneth walked to the shipwreck to survey some lumber. He intends to construct a house a few yards to the left of the beacon.

Oct. 9. Kenneth visited the shipwreck twice, returning with lumber. We are all kept busy surfing, exercising and reading. Since the departure of the Itasca the weather has been good; no rain, the ocean smooth. Oct. 10. Kenneth made two more trips for lumber; he is anxious to complete his house. Dan went lobster hunting on the reef to the north when the tide was low; he got a dozen and one 'u'u fish, eaten for supper.

Oct. 11. Henry and Dan discussed building either a frame house or a grass shack. Dan scouted for lumber, bringing back a load via the water route. He pulled it around the SW corner, as a raft--easier than carrying it across the island. Henry collected shells; Jacob also collected shells on the reef. Oct. 12. Kenneth visited the shipwreck twice, securing lumber. Dan made one such trip, pulling a load of lumber around the SW end.

Oct. 13. Kenneth made two trips to the shipwreck for lumber. Henry collected shells on the west beach. Dan Toomey and Louis Suares (of Coman camp) incorporated to build a house around the south and west sides of the beacon. It will be a two-story house with the inside of the beacon turned into a room.

Oct. 14. Kenneth began to construct his house, working on it all day. Henry went shell hunting along the western beach. Dan and Louis worked on their house all morning and went for more lumber in the afternoon.

Oct. 15. A heavy shower in the early morning, off and on for half an hour. Two more showers about 2:00 P.M.; the sky overcast most of the day. Kenneth gathered more lumber and worked on his house. Dan and Louis continued building a sturdy foundation for their two-story house.

Oct. 16. Kenneth made two trips to the shipwreck for lumber. Henry and Jacob made an oven out of an empty 5-gallon flour can. They baked biscuits in it. Dan, Louis and Bill Chadwick went fishing on the reef, SW of the beacon. They found two lobster holes and collected a total of 25 lobsters; eaten for supper and breakfast.

Oct. 17. Transporting lumber from the shipwreck still going full blast. Kenneth and Dan working hard on their house. Henry continues to collect shells on the SW beach. Henry, Jacob, Louis and Bill went fishing. Henry speared a six foot shark, the largest captured on Jarvis. Weather fine and cool. Oct. 18. More lumber hauling and house construction. Two days ago we had our last pork and beans. A quarter bag of potatoes spoiled on us. Oct. 19. House construction continues. Henry and Bill Chadwick collected shells. They spent the evening in the radio shack and learned that Kam gridders were victors over their long-time rivals, Punahou; score 19 to 6.

Oct. 20. Another Sunday. Dan collected shells before breakfast and also speared a large-size moana [goat fish] which was enjoyed for lunch. Kenneth continued to get lumber and work on his house. Dan Toomey rigged up a reading light, using two dry cells and a 2.4 volt bulb.

Oct. 21. Provisions were checked this morning by Henry Ahia. After that he and Jacob collected shells. Kenneth made two trips to the shipwreck for lumber and worked on his house. Dan and Louis did a little work on their house. There was a heavy shower at 4:00 A.M., total 0.05 inch. In the evening Kenneth and Louis went into the field to collect booby eggs. They got a total of seven to eat for breakfast tomorrow.

Oct. 22. Kenneth early this morning went into the field again to get more booby eggs; only two of the seven he collected were good. He found 14, ten of which were good to eat cooked with corned beef hash; they did not have a fishy taste. Dan made five trips to the shipwreck.

Oct. 23. Kenneth spent all morning working on a map of Jarvis Island. In the afternoon he carried 14 bags of gravel for the floor of his house. In the evening he moved from the cottage into his newly built house. He rigged up a lighting system with five dry cells and an 8 volt bulb. Dan worked on his surfboard. After lunch he and Louis went to the shipwreck for more lumber, transporting it home on a cart which Louis had made. Henry and Jacob collected shells.

Oct. 24. Henry collected shells, beginning at the shipwreck and going three-quarters of the way around the island. Kenneth worked on his map, and with Dan and Louis selected lumber at the shipwreck. A common sight from the cottage in the evening: schools of porpoises swimming in endless numbers. When it is calm, we also see a few sting rays in the channel of the landing place. News was received by radio that the Itasca will sail from Honolulu to San Francisco within three days.

Oct. 25. A very light shower greeted us this morning at 6:00. The sky was completely overcast with cumulonimbus clouds. The wind (19 miles per hour) blew the clouds past the island. Later the sky cleared. Jacob, Kenneth and Louis walked to the SE end of the island to check on some coral ridges this morning. They located some old guano track trails to add to their maps. Henry worked on a map of the island in the morning and collected shells in the afternoon.

Oct. 26. Henry and Kenneth worked on their maps. Kenneth rigged up a table light with five dry cells and an 8-volt bulb. Dan erected a new flagpole on the beacon, above which it protrudes 12 feet. The beacon is 25 feet high. Dan and Louis at 9:30 went into the field to study different types of booby birds. They killed a few eels and collected some shells by flashlight.

Oct. 27. This morning we put bos'n bird eggs in our hotcakes. It made the cakes fluffy and gave them color. Out of 14 eggs collected four were good. The tide was unusually low around 9:00 A.M., so we did some fishing. Dan and Henry caught two lobsters, also two large red snappers.

Oct. 28. Dan made two trips to the shipwreck. He and Louis brought back 30 pieces of lumber on the cart. These were for the floor of the house they were building. Henry checked the ration supply, worked on his map, and collected shells. Later he worked on a T-shaped marker on the airfield. Kenneth gathered clam shells to decorate around his house. In the evening he collected bos'n bird eggs. The ocean began to get rough, with big breakers and a strong undertow. Kenneth, Jacob, Henry and Louis went surfing.

Oct. 29. Kenneth collected more eggs. A dozen of his 20 were good. They were cooked for breakfast. Henry worked on flattening a mound in the airfield. Others collected shells. After supper Dan and Louis worked on the floor of their house. Two cans of poi had a bad odor and were unfit to eat. This is the first time this had happened.

Oct. 30. Henry worked on his map and laid out his shells, over 300 worthy of recognition. He sorted out the best. In the afternoon he hunted more shells on the beach north of camp. Kenneth and Jacob made two trips to the shipwreck for lumber. They will make two 11-foot surfboards.

Oct. 31. Dan Toomey took an inventory of provisions, water and supplies. We have plenty, but not much variety in foods. Kenneth worked on his surfboard in addition to recording weather. Henry, Dan and Jacob hunted for shells, finding quite a lot in good condition. Large waves at 3:00 made surfing exciting.

Nov. 1. Jacob recorded weather and worked on his surfboard. Henry worked on his map in the morning and collected shells in the afternoon. Kenneth completed work on his surfboard. In the afternoon he went surfing with Jacob and Louis. The waves last night washed up higher on the beach than Dan and Henry had seen during their stay (about 7-1/2 months). We enjoyed a 3/8ths yellow moon and its reflection on the ocean.

Nov. 2. Dan worked on his house all day, between recording weather. Henry collected shells and leveled a mound in the airfield. Jacob worked on his surfboard. He went surfing with Kenneth, Henry and Louis. Kenneth sandpapered his surfboard and made a shade for one of the windows of his house. Henry visited the radio shack and learned the results of a football game: Kamehameha 30, Roosevelt High 13.

Nov. 3. Henry recorded weather, collected shells and went surfing. Others also went surfing. Kenneth collected eggs of a booby and a booby; boiling made them just like rubber. Dan and Louis spent the day at the shipwreck cutting more lumber. They started back with 60 pieces on the cart. After 300 yards the axle broke.

Nov. 4. A new axle stood the load for about 100 yards and also gave way. They off-loaded half the lumber and hauled the rest to camp on a third axle--a steel shaft. They worked on their house until 5:00 and then went lobster fishing, getting only one. Kenneth recorded weather. He was appointed by Henry to take charge of the medical supplies. He transferred them from the tent, where the weather instruments are located, to his house.

Nov. 5. Henry collected shells, leveled a mound, and made a windbreak for a coconut palm out of a gunny sack. In the evening he, Kenneth and Louis went torch fishing. Dan and Louis worked on their house; Kenneth on his map; and Jacob on his surfboard. In the evening there was a "mouse"-killing jaunt, over fifty by torch-light.

Nov. 6. Henry and Bill Chadwick went on a shark hunt. Dan worked on his house while recording weather. Kenneth and Jacob hunted for shells. Kenneth made a closet and a towel rack in his house. Jacob worked on his surfboard. Bill Chadwick hooked an octopus which measured about 8 feet from tip to tip. After considerable pounding and boiling, half was fried for supper and the rest dried.

Nov. 7. Fishing, between recording weather, Henry Ahia caught three good sized sharks. At about 9:30, Dan, Kenneth and Louis caught 197 aholehole in Dan's surround net near the channel at the SW end of the island. They used some of the fish as bait to catch sharks. Louis caught two sharks, and Kenneth caught two red snappers and four other fishes. Seventy aholehole were cleaned and dried, also all next day.

Nov. 9. Jacob worked on his surfboard, between recording weather, and went surfing with Kenneth, Henry and Louis. Dan Toomey (who keeps the log) went lobster hunting, catching four, which were eaten for lunch. In the evening, Dan and Suares caught over 300 aholehole in the surround net at the landing site. About 40 of the largest were kept, the rest thrown back into the sea. Eleven were cleaned for drying; five eaten for breakfast; the rest used for catching sharks by Henry and Kenneth. The beach SW of camp was considered the best area for shell collecting on the island. Much time is being spent in shell collecting and hunting for sharks, caught for their jaws. A heavy shower from 10:40 to 11:15, 0.09 inches of rain.

The usual activities on Nov. 11, Nov. 12, Kenneth constructed a flagpole and put it in front of his house, flying a small American flag. Dan and Louis fished for sharks and collected shells on the east shore. They caught three sharks and extracted the jaws of two. An eel tried to bite Dan's ankle. On the way back they discovered a lobster hole and collected 30 for supper and breakfast. Henry and Kenneth visited the radio shack and talked with Howland.

Nov. 13. Jacob carved his name on his surfboard between making weather records. Dan and Henry worked on

the roof of the cottage. At the radio shack, Henry and Kenneth heard signals from the Kinkajou. Nov. 14. Heavy shower at 5:50 A. M., 0.09 inch in five minutes. Kenneth, Jacob and Henry made fishing poles and caught four 'u' trying them out; eaten for supper. Louder signals from the Kinkajou.

Nov. 15. Dan and Louis journeyed across the island to the SE corner to measure the height of the ground above sea level at about ten places. Nov. 16. Between taking weather observations, Kenneth cleaned the gymnasium tent and put paper on the roof of his house. Others collected shells. Henry's collection still the best.

Nov. 18. The ocean began to get rough today, with big breakers--good for surfing.

Nov. 19. Kenneth constructed a high jump stand, while Jacob dug the jumping pit. After lunch, the whole group participated in track events, high jump and shot-put. Dan and Louis caught a large school of aholehole; 50 were kept, about 30 cleaned and dried, the rest eaten for supper. Dan moved into the house he and Louis built.

Nov. 20. Henry cleaned and rearranged the cottage. Dan got more lumber for a 14-foot surfboard, with the help of Jacob and Louis. Nov. 21. Jacob went surfing with Louis. Henry made two shell collecting trips. Dan worked all day on a 14-foot surfboard; the 12-foot one he had made wasn't large enough for him to stand up on. Dan and Louis practiced the shot-put.

Nov. 22. Kenneth caught, cleaned, cooked and ate a young bos'n bird. He planted "mau" in front of his house. [Ma'o is the ilima-like Abutilon.] Jacob and Louis surfing.

Nov. 23. Jacob made a shelf to display his shells. Kenneth made a "harpoon gun." Dan worked on his surfboard. All went surfing. Bill Chadwick's radio brought news that the volcano was erupting near Hilo, from Mauna Loa. Nov. 24. A quiet day, the tenth Sunday since the departure of the Itasca. Nov. 25. Henry checked provisions.

Others went surfing, insect and shell collecting. Nov. 26. Kenneth and Jacob made sling shots and shot "mice." Everyone went body surfing in a very rough ocean, the waves rolling up to within a few feet of the beach crest. Nov. 27. Everyone was out looking for shells. Body surfing in the afternoon.

Nov. 28. The flag was flown in observance of Thanksgiving Day. We had ham in the absence of turkey; our "best dish on Jarvis." Nov. 29. Dan hunted shells and made two shelves for the "beacon house." Surfing in the afternoon. Kenneth planted pig weed and 'ilima in gallon cans and put them in the shade of the beacon. Henry cleaned and oiled some tools.

Nov. 30. Shell collecting dominated the day. Dan and Henry took inventory of supplies and provisions. We have run out of evaporated milk, corn, pineapples, Vienna sausage, and rice. We have a few more cans of ham and poi. Corned beef will be our main dish until the Itasca returns. Ample water and kerosene.

Dec. 1. Today's activities were mainly recreational: shell collecting, surfing. Dan cleaned rust off tools.

Dec. 2. When not otherwise employed--plenty of reading and playing musical instruments. The ocean quiet again. Dan made a harpoon with which to spear sharks and large fish. Others read and collected shells. Henry visits the radio shack most evenings.

Dec. 3. Henry cleaned and oiled tools, putting them away in wax paper. He began to make three outdoor stoves out of empty kerosene cans. Dec. 4. Overcast sky and a light shower at 8:10 A. M. The sky cleared. Some surfing at 10:00, and shell collecting. Dec. 5. Between recording weather, Henry finished the outdoor stoves. Surfing in the afternoon. Dec. 6. Dan went on an early morning shell hunt. Surfing at 9:30. Henry got some fine shell specimens across the island. Dec. 9. Dan collected shells and at 9:30 went spear fishing, catching 13 aholehole, cleaned by Henry for supper. Kenneth and Louis studied plants in the field.

Dec. 8. Shell collecting and surfing. Kenneth made a kite and tried flying it. He tied the cord to the flagpole in front of his house and let it fly all day. Dec. 9. Dan, Kenneth and Louis went spearfishing. They caught 5 uhu, 1 moana, and 1 ulu. Henry cleaned the fish for supper. Kenneth and Louis made two electric buzzers to practice the code, transmitted by wire between Kenneth's house and "Beacon house."

Dec. 10. Henry collected shells on the eastern shore; Dan on the beach north of camp. Between recording weather, Kenneth worked on his buzzer.

Dec. 11. Jacob recorded weather and went surfing with Henry and Louis. Dan, Kenneth and Louis went spearfishing after lunch, catching 8 aholehole and 1 ulu; cleaned by Dan and Henry and eaten for supper. Since November 30, our main dish has been corn beef, supplemented by fish and lobster, when the ocean is not too rough. We have run out of baking powder, canned poi, peaches and peas. We have one can of ham, which we are saving for some future holiday. We have lots of fruit juices and can get along until the Iasca arrives.

Dec. 12. Henry collected shells all morning and went surfing with Kenneth, Jacob and Louis in the afternoon. Dan recorded weather. The lack of sufficient food has compelled the two members of the Cornan camp to dine with us.

Dec. 13. Dan and Louis went lobster hunting and fishing on the reef. They caught 7 lobsters, 1 'ulu, and 6 aholehole. These were eaten for supper. Dec. 14. Henry and Bill Chadwick made a trip to the shipwreck and hauled some lumber to camp. They plan to build a raft. Dec. 15. Dan took inventory of provisions and supplies. We have food to last at least 25 days. Henry worked on the raft and speared fish, catching half a dozen aholehole, which we ate for lunch. Kenneth constructed a path from his house to the beacon. Dec. 16. Henry and Louis went spearfishing in morning and caught a dozen aholehole, which we had for lunch. Again, in the afternoon they caught 16 aholehole and 3 lobsters for the evening meal.

Dec. 17. Henry, Dan and Louis went net fishing north of camp and caught 150 aholehole. They cleaned 45 for the next three meals, also 25 for drying. The balance were thrown back into the ocean. The next few days followed the same pattern. The number of aholehole caught were as follows: Dec. 18, 62; 19th, 50; 20th, 45; 21st, 56; 22nd, 60; 23rd, 36; 24th, 40.

Dec. 20. In the evening everyone wrote a few lines of Christmas greetings to folks back home, and Bill Chadwick sent these by amateur radio to Honolulu. On Dec. 21, Dan caught an octopus, about 6 feet across. He pounded and salted it. In the afternoon all joined in launching the raft built by Henry. The whole Jarvis Island personnel, while on the raft, were suddenly struck by a big wave which threatened to capsize the raft. A strong current, flowing out to sea, held the raft marooned in the channel for quite a spell. If the rope which held us to the shore had been weak, we no doubt would have been swept to sea. We finally managed to haul the raft to shore. Everyone was cool-headed during this exciting experience.

Dec. 23. Kenneth journeyed to the shipwreck and brought back a load of lumber to repair the roof of his house. Dec. 24. Henry cleaned up his cottage; and Jacob did the same in his, and also went surfing with Louis. Dan hauled gravel between recording weather.

Dec. 25. The flag was flown in observance of Christmas Day. The ham was cooked for Christmas dinner.

Dec. 26. Henry chopped wood, repaired his cot, painted his surfboard, and stewed a "quail" bird, which Louis had caught, with tomatoes and dill pickles for lunch. Some thought (or at least said) it was "delicious"; others were less enthusiastic, but at least it filled their stomachs.

Dec. 27. Dan, Henry and Louis went fishing with it surround net, catching 60 aholehole. An octopus, about 6 feet across, pounced on one of the fish in the net and succeeded in swimming to a hole. Dan hurried to camp for spears and they captured the octopus. The fishes were

cleaned for meals; the octopus was pounded and dried. Henry also caught a shark and extracted the jaw. Henry sandpapered his surfboard between recording weather. Kenneth painted his surfboard and made a pair of wooden slippers.

Dec. 28. Surfing and fishing were the order of the day; 56 aholehole caught. Henry learned at the radio shack that the Kinkajou was expected to arrive tomorrow.

Dec. 29. At 7:15 A. M. the Kinkajou was sighted on the southwestern horizon. The ocean was calm and the yacht used its engine to come up to shore. It did not anchor, but drifted off and came back by power. At 9:00 A. M. the skipper, Captain Constantine Flink, two Samoan members of the crew, and two Kamehameha School boys, Elmer Williamson and Arthur Harris, who had been stationed on Howland and Baker, respectively, came ashore. They brought letters from Honolulu. We learned that the Kinkajou had visited Samoa and 13 other islands in the South Seas. We also learned that the Itasca will sail from Honolulu for one of our islands on January 7. Kenneth Bell went on board the Kinkajou with the first returning boat and talked with Dr. Francis Dana Coman, of Johns Hopkins University, and Kenneth Lum King, of Honolulu, radio operator stationed on Howland for the Coman Expedition. Henry and Dan also went on board, and all were warmly received. They had lunch on the Kinkajou.

After lunch, Dr. Coman, Kenneth Lum King, and some members of the crew came on shore. A strong current and big waves had the boat marooned for about half an hour in the channel, and the oarsmen certainly were tired when shore was reached. Henry showed the visitors around camp. Dr. Coman went into the field to look over the guano prospects. He highly commended us on the improvements to our camp. Members of the crew visited the "Amaranth." We all wrote letters to folks in Honolulu in answer to the ones received. Dr. Homer F. Barnes, Principal in charge of the Kamehameha Schools, sent Henry Ahia and Toomey their pay checks for the six months from March to August. These checks were left with Dr. Barnes by Mr. W. T. Miller, to be forwarded to the boys as soon as possible. The boys endorsed the checks and sent them back to Dr. Barnes to be cashed. A

letter of thanks was also sent to Miss Bertha Van Auker, matron of the Boys' Dining Hall, for the things sent to us by her. Henry Ahia also wrote to Mr. Clarence V. Budd, thanking him for the magazines received from him. We also received copies of "Ka Mo'i," Kamehameha Schools weekly paper from Mr. Loring G. Hudson and thanked him for them. A letter addressed to the four boys of Jarvis was received from J. N. Taylor of Washington, D. C. Enclosed were two newspaper clippings about us here on Jarvis and the other two islands: one from the New York Times, Sunday, Sept. 1935, a picture; and the other from the Sunday Star, Washington, D. C., October 20, 1935, a long news story describing the reason for the colonization of the three islands, and four pictures of the islands. There was a return stamped envelope on which Mr. Taylor wished us to indicate that it came from Jarvis Island and close to the equator, as he is a stamp collector. He also asked us for our home addresses.

About 5:00 o'clock this evening, with all the equipment of the Coman camp stored on board the Kinkajou except one tent, three drums of water, and the radio antenna, which is still on the island, most of the crew went on board the Kinkajou. Dr. Coman, Kenneth Lum King, Elmer Williamson, Louis Suares, and two members of the crew had supper with us before going on board. The Kinkajou got under way at 6:15, and we all sat in the cottage watching it until darkness hid it from our vision, taking from the island Bill Chadwick radio operator, and Louis J. Suares, fellow Kamehameha student, who had been resident of Jarvis since September 1st. Food stuff left us from the Kinkajou includes sugar, canned tuna, canned grapefruit juice, dried apples, bacon and Crisco, which we certainly needed.

Dec. 30. Early this morning, before breakfast, Kenneth Bell covered the roof of his house with wax paper to keep the rain out. The velocity of the wind was low, the best time for such work. He also kept weather records. The rest of us read or talked about the coming of the Itasca. Henry trimmed Dan's beard.

Dec. 31. Henry had obtained a hacksaw blade from the Kinkajou, and early this morning, after breakfast, he

journeyed to the "Amaranth" to finish cutting off the steering wheel. However, the blade broke while he was sawing. He returned to camp with some souvenirs of the wreck for Don Mitchell, of the Kamehameha faculty. In the afternoon he went spearfishing, catching four aholehole, which we had for supper. Jacob was recording weather. Dan took inventory of provisions and other supplies. We enjoyed some Chinese sweet seeds which Jacob had received from Honolulu via the Kinkajou.

Jan. 1, 1936. Only the daily chores to write about. The whole group spent the day reading. Kenneth collected a few shells. Jan. 2. Henry recorded weather. The group passed the time reading. Jan. 3. Henry went spearfishing and got 10 aholehole and one uhu [parrot fish], which we ate for supper. Dan collected shells. Jan. 4. Henry went spearfishing and got a dozen aholehole. Dan and Kenneth speared two uhu on the reef. Jan. 5. Henry speared ten aholehole and two uhu on the reef. Our main diet is now fish, fried or boiled, with hard tack, jam, and canned tomatoes, cooked with white beans. We also dill pickles, sauerkraut and spinach. Kenneth packed up his personal belongings in boxes. Jan. 6. Dan speared six uhu, which we had for supper. Henry recorded weather and sandpapered the rust off some tools. Jan. 7. Henry speared 15 aholehole and two uhu. Half the aholehole were eaten for lunch, the rest for supper. While Henry was cleaning the fish a shark came up near the beach. Henry yanked it by the tail, clear out of the water and up on the beach.

Jan. 8. The ocean was calm this morning and the raft was put into the water. We all fished from the raft: uhu and popa'a (for bait). Henry trimmed Dan's hair. Later he went spearfishing and got a dozen aholehole for supper. Jan. 9. Henry speared ten aholehole and four uhu. Later he oiled all the tools. Jan. 10. The raft washed ashore and was partly wrecked. Henry chopped up the wood for firewood. Dan and Kenneth went lobster hunting and found eight and one moana. The flag was raised and it will continue to fly until the Itasca arrives.

Jan. 11. Henry caught a large red snapper at the southeast end of the island, we ate it for lunch. Dan packed

his belongings, ready for shipment. Jacob installed new dry cell batteries in his lighting system. Rain today from 2:00 to 2:45, 0.10 inch.

Jan 12. House cleaning, shell collecting, and fishing (20 aholehole and a lobster) filled the day. Jan. 13. Dan and Henry caught four lobsters and ten aholehole. More shell collecting. Jan. 14. Ten more aholehole, all eaten for supper. Kenneth made a trip to the shipwreck for lumber to make a floor for his house. We were all certain that the Itasca would come tomorrow.

Jan. 15. The Itasca was sighted at 9:30 A.M. by Henry Ahia. We were delighted to see her. Our food supplies were about exhausted. All we had were eleven gallons of tomatoes and five pounds of beans. By eating fish we had made our three months supplies last for four months. Also at our meal table were two men of the Coman Expedition, who ran out of food on December 12 and ate with us until December 29.

The first boat in brought Mr. Miller, Captain Meyer, Sgt. Collins, and seven Kam boys, namely Solomon Kalama Joseph Kim, W. Yomes, Alexander Kahapes, Henry Chumkini, George Kahanau, and Henry Mahikoa, the first three graduates of the school. Luther Waiwaiola, a graduate, in charge of shipping our food supplies, taking their liberty later. We were glad to see our friends again. Henry Ahia and Dan Toomey, who had been on this island for ten months prepared to return home.

Kenneth Bell was appointed leader on Jarvis; remaining with him were William Yomes, Henry Mahikoa, and Jacob Haili. Mr. Miller took motion pictures of the four boys who had lived on the island, and later of the four boys who were to stay. Kenneth and Jacob were invited on board the Itasca and were cordially greeted by Captain Brown, who seemed to be a jovial person. They were given a big dinner: At 3:00 P.M. they returned to the island, along with the crew going on liberty. A hacksaw was brought from the ship, and Sgt. Collins and a lot of sailors crossed the island

and brought back the steering wheel of the "Amaranth." Two 8 x 8 x 10 inch posts were also brought for the purpose of building a platform for the cannon that is in the Bishop Museum. This old cannon was found on Baker Island. Shells for the museum were also selected from those collected by the boys on Jarvis. At five o'clock a call was given for all visitors to return to the ship, and farewells were said. The Itasca left for Baker and Howland. Kenneth, Henry, William and Jacob started to carry the provisions to the supply tent. At seven o'clock Henry and William enjoyed their first meal since sailing from Honolulu.

Jan. 16. Jacob Haili recorded weather and showed Henry Mahikoa how to use and read the various instruments. Our daily routine started off with Henry and Jacob cooking and William and Kenneth washing dishes. After breakfast we continued to carry our provisions to the supply tent. Kenneth built shelves in our kitchen. During the afternoon Henry explored the island. At 5:00 Haili had the pleasure of clipping Mahikoa's hair.

Jan. 17. William Yomes started his first day on duty. He and Henry had learned the use of the instruments. Jacob and Kenneth helped him to describe the different clouds, but only a few types of clouds had appeared so far. Kenneth, Henry and William put the food tent in order and took inventory. We have 37 drums of fresh water. In the afternoon Henry and Kenneth collected shells. The new boys learned the Jarvis way of surfing.

Jan. 18. Henry Mahikoa came on duty for the first time. Kenneth and William repaired the road to the beach so that it would be easier to roll the drums of water up to the houses. The old road had been wrecked by the gigantic waves we had, at which time the water rose to about the level of our houses, 15 feet above sea level. Henry and Jacob checked an inventory of tools and equipment. Henry and Kenneth planted two coconuts in cans, 14 inches square. A lot of plants had been sent to Jarvis by the H.S.P.A. [Hawaiian Sugar Planters' Association] of Honolulu. We will also endeavor to plant the seeds taken from fruits given to us--avocado, prunes and dates. In the evening, before

supper, Henry sat on the beach, deciding whether to bathe, or fool the sharks and not bathe. The sharks, appearing to be away, he finally waded in about ten feet. He soon came out faster than he went in, a six foot shark at his heels. The shark was soon caught with a hook by William and Henry, making the event the first of their shark experiences on Jarvis.

Jan. 19. During the morning the four brought up two drums of water; 12 had been brought to the island this time. Then we went fishing. When Henry first saw the schools of aholehole, he got so excited that the spear he threw fell short. After fishing, we amused ourselves surfing. William Yomes planted two coconuts in cans. If the trees sent by the H.S.P.A. grow, we will have the pleasure of resting in their shade, and may possibly acquire more rain.

Jan. 20. Two more water drums were hauled up to the beacon. The tide today varied: low for a few minutes, then rising suddenly, to rage violently. William and Jacob did their first surfing in the afternoon.

Jan. 21. The young trees and shrubs seem to be growing nicely, with the exception of the coconut palms. Two more water drums were hauled up, made easy by using a on inch rope 100 yards long. Both ends were tied to the beacon and the two parts laid parallel down to the beach 50 yards below the beacon. The drum was placed on the two lengths and the slack was thrown over and used to roll the drum up the hill. Kenneth showed William and Henry the different devices used in our gymnasium.

Jan. 22. Henry recorded weather. We also record the tide. We hauled up two more drums of water and then went fishing and later surfing. The newcomers are becoming expert. Jan. 23. Two more water drums hauled up. Kenneth dug up a coconut palm, which had been planted last March, and put it in a large can with a sand foundation. This is the only one of those planted in rich guano soil which had survived. William is quite a musician and can produce piano chords on a guitar.

Jan. 24. This morning the entire population of Jarvis united to roll the last two water drums from the beach to the beacon. Kenneth, Henry and Yomes made a trip to the shipwreck to bring back more lumber. Kenneth and Henry began building another room on Jacob's two-story house. Jan. 25. Kenneth and Henry obtained more lumber from the "Amaranth." Our coconut pals are growing nicely. A new moon found Jacob and William strumming their stringed instruments.

Jan. 26. Sunday was distinguished by the singing of a few humns, swimming in the afternoon, and music in the evening. Jan. 27. More lumber was brought over from the "Amaranth." We practiced Hawaiian songs in the evening. Mahikoa is the best tenor of the island; William, baritone; and Jacob, second base. Jan. 28. Kenneth and Henry carried seven bags of gravel for the new room, used for flooring, for wood is becoming scarce. In the afternoon everyone reported to the gymnasium for their daily exercises, which are taken seriously on Jarvis.

Jan. 29. Kenneth, William and Henry started a roofing job on the home of William and Henry. The tent fly, which had been used previously as protection against the rain, was removed and replaced with genuine roofing material and yard-wide strips of canvas. Some read the new magazines, contributed by several ladies and gentlemen in Honolulu, brought down on the Itasca; others hunted for shells. Music in the evening.

Jan. 30. All swam for fifteen minutes before lunch. The sharks seemed to mind their own business, so we left them alone. In the evening Kenneth and William combed the beach for more shells. Jan. 31. An inventory was made of our food supply, tools, equipment and various miscellaneous articles. All went for a swim in the channel, then to the gymnasium at 3:30 P.M. In the evening, to Kenneth's home for a card game; and last to the home of William and Henry for refreshments--cookies and orange punch.

Feb. 1. All worked on the "future, proposed landing field, "leveling mounds and filling holes. When it became

too hot, back to camp for a swim in the channel before lunch. Unable to get to the Royal Hawaiian Hotel, we play our own music and dance with boxes or chairs.

Feb. 2. All spent spare time studying various chor on the guitar and ukulele. William taught the others an advanced lesson in the usage of minor and broken chords. Feb. 3. A coconut palm was transplanted at the left front of Kenneth's home. It seems to be the strongest of the four that were brought here. Large rollers thundered in on the beach and wrecked the slab walk up from the beach; about the fourth time it has been washed out. In the afternoon we collected shells for the Bishop Museum. Insects, birds' eggs and fishes are also being collected for the Museum.

Feb. 4. Additional roofing material was put on William and Henry's house. One hundredth of an inch of rain which fell last night, proved that the previous roofing was inadequate. Jacob uses canvas to protect destructible equipment. Feb. 5. Henry and William have been here three weeks. Jacob and Kenneth have been away from Honolulu for five months. The island today was combed for insects. Quite a few kinds were found. Because of the lack of diving goggles, we have difficulty in spearing small fish as specimens that dwell in holes and under coral rocks. Feb. 6. A passing nimbus cloud brought a light shower, lasting only a minute or two. The longest recorded rain on Jarvis was 40 minutes. William hunted for shells halfway around the island.

Feb. 7. Kenneth planted a hala tree, brought from Honolulu, in front of the home of Jacob Halli. Ken's coconut palm seems to be in fine condition, growing well. One of the four coconuts brought from Palmyra died.

Feb. 8. A ship was sighted soon after breakfast. It came from the north and drifted by on the horizon and steamed away to the westward. It looked like a large steel freighter, with one mast and a derrick in the front part of the ship and another mast in the stern. Its color was gray, and it had one large, low smokestack. When it was seen at 8:05 by Kenneth, the American flag was hoisted over the beacon.

Feb. 9. All four went fishing. William caught an uhu, and the others 12 aholehole. These were cooked by Henry, who is a first rate cook. An outdoor stove, made of three kerosene tins, is used with wood as fuel. Two rods serve as rests for pots.

Feb. 10. Kenneth, Henry and Jacob covered the island, scanning the ground for relics that might have been left by the guano workers. A mirror frame, measuring 12 x 20 inches, was the only article they brought back to camp. Later, a swimming contest was held in the channel, racing against the strong current. Later in the afternoon we played baseball. The balls and gloves had been loaned to us by Mr. William Wise, athletic coach at the Kamehameha Boys School.

Feb. 11. While on duty, Henry Mahikoa began the job of reconstructing the coral slab walk that leads from the main house to the beach. Feb. 12. The American flag was hoisted today in honor of President Lincoln. William speared his first uhu, and Jacob, Henry and Kenneth brought in a few aholehole and uhu, which provided a hearty meal. In the afternoon William and Henry made a trip around the island, bringing back some rare shells.

Feb. 13. Jacob recorded weather. The others hunted insects. The insect that is of greatest abundance, and which breeds in pickleweed patches, is a cream colored moth. The most pesty insect is a black fly, about half an inch long, which resides in the feathers of frigate birds; it makes frequent visits to camp and bothers us. Luckily we do not have any mosquitoes or centipedes. A few insects have been brought here by the Itasca and the Kinkajou. They dwell mostly in the onions and potatoes. There is also a black bug [beetle?] which ravishes all food-stuffs and anything that is not covered or protected.

Feb. 14. William Yomes on weather duty. The others started toward the airfield with picks and shovels. They stopped at 10:30 and returned to camp. The rest of the day spent in reading and music. Feb. 15. Kenneth installed a lighting system in his new room, used frequently now; and

also by Kenneth and William as their sleeping quarters. The walls are only half the height of the room, and they find it refreshing. It is also used as a lounging, reading, and music room.

Feb. 16. Henry and William hunted shells. Kenneth planted another hala. All the plants seem in fine condition.

Feb. 17. Jacob Haili on duty. The others speared fish on the east side of the island.

Feb. 18. Kenneth tried collecting birds' eggs. He had quite a time getting some from frigate nests, for the birds would swoop down and attempt to peck him. He blew one egg in less than 30 seconds; but on another occasion he blew so hard the egg was smashed. Fortunately none was rotten.

Feb. 19. Henry recording weather. The others hunted insects, returning with cockroaches, ants, bugs of various sorts, and lizards. Jacob and Henry planted pickleweed in front of their houses; then went surfing. Feb. 20. Kenneth recorded weather. The others went spear fishing on the east side. The tide was low and it was possible to walk along the edge of the reef. They found about 100 aholehole in a pool and about 60 were caught.

Feb. 21. Jacob on weather duty. The others went to the channel to catch sharks. Two, with white-tipped fins, small but with sharp teeth, were caught. They were different from the yellow-fin and gray-fin sharks. Feb. 22. William Yomes recording. Henry and Jacob went spear fishing. No aholehole seen until about 11:30. Then Jacob sighted a school of about 500. Henry blocked their escape, and Jacob speared until their two fishing bags were full, a total of 80 aholehole. The rest of the day was spent cleaning, salting and drying.

Feb. 23. Henry recording. He started making a larger fishing bag, ten by twenty inches, out of canvas, with cross-straps. He sewed two bug bags together to make a net, with a four foot mouth. Kenneth also made a fishing bag out of brown canvas. They have made fish drying an "industry."

Feb. 24. Kenneth Bell recording. He also planted four hala trees. Henry, William and Jacob set out at 8:30 for the western fishing grounds. The tide again was low. After combing the reef for about three hours, Bill sighted a school of aholehole, and these were corralled in a perfect coral trap. Bill sat in the three-foot passage to prevent the school from escaping. About 500 fishes were in a pool only 20 feet in circumference. Spearing being too slow, the boys used Henry's net and had soon captured about 300. They threw back the smaller ones and kept the rest. They emptied the fish on a large dry part of the reef, and were getting ready to make a second scoop when a five-foot eel came gliding out of a hole. Bill jumped away from the opening, and the eel glided through. They took their catch back to camp and, after lunch, spent the afternoon cleaning the fish.

Feb. 25. Jacob on duty. Henry visited several birds' nests and brought back their eggs. Kenneth, William and Jacob fished for different kinds of fish specimens. They brought back several. At noon, all went swimming in the channel. Afternoon and evening reading and swimming.

Feb. 26. William on duty. Henry and William caught two sharks. We can tell four kinds apart: gray-fin, white-tipped fin, yellow-fin, and hammerhead. When fishing, swimming or surfing, the gray-fins are the ones that bother our conscience most when we are in deep water. We are not afraid of them on the reef.

Feb. 27. Henry took over weather observations at 6:00 A.M. The others started filling in various gaps in the airfield. After two hours they had to stop because of rain. Jacob ran back to cover the bed and table in his room, but found them already wet. He slept that night under a large canvas. Feb. 28. The morning was fine, and wet bed clothes were spread over the "slab-rock" to dry. Henry went looking for eggs, coming back with two frigate eggs, three booby eggs, and one tern egg. William taught Jacob how to make cords on the "silent piano," a standard keyboard which Ken Bell had drawn.

Feb. 29. Kenneth and Henry went out to hook sharks but none appeared. William went hunting for shells. Jacob transposed songs into guitar solos between weather observations.

March 1. William Yomes recorded weather. Henry transplanted two hala trees in holes three feet deep, refilling the holes with a mixture of sand and Honolulu soil. In the afternoon Jacob and William took advantage of large rolling waves to go surfing. March 2. Henry recorded weather and everyone else collected specimens. March 3. Kenneth Bell on duty. William and Henry circled the island collecting shells. Jacob clipped Henry's hair. March 4. Jacob recorded weather. Kenneth collected a sack full of shells along the south shore. All went for a swim in the channel in the evening.

March 5. William Yomes on duty. The others went fishing. William sighted the Itasca before they got back. The first boat landed at about 11:10 A.M., with Mr. Miller, Captain Meyer and Major Bissel, with Executive Officer Kenner in charge. A group of Hawaiian boys and Army men arrived to break camp, including Austin Collins, Ralph Wilson, Mr. Raine and William Wilson. Within an hour all was packed, including all equipment and food still in good condition, ready to go back to the ship. All that couldn't be salvaged was piled together and set on fire. As the flames and smoke started to roll up, marking the end of a year-long project, a sudden hush came to those assembled on the beach. The Itasca steamed closer to shore. At the water's edge the launches were waiting to take us back to the ship. Then, with simple ceremony, we gave our last salute to Jarvis Island. With everyone standing at stiff attention to the colors, Austin Collins, Daniel Toomey and Henry Ahia lowered the American flag, which had been raised a year ago. Then turning our faces to the north, we hurried down to the waiting launches. We set sail for Honolulu aboard the Itasca, bidding farewell to dear old Jarvis Island, our home for the past months.

5. HOWLAND ISLAND AND ITS AIRSTRIP

The mission of the party of "colonists" on Howland Island was summarized by Corporal Harry L. Theiss, who was in charge of the original party from March 30 to June 1 1935, as follows:

1. Keeping a check on weather conditions.
2. Farming: cultivating coconuts, vegetables, flower seeds
3. The study of bird life.
4. Collecting specimens for Bishop Museum
5. Mapping the island
6. Fishing: recording the types caught (also as food)
7. Landing field: preparing most suitable area
8. Daily log: recording all happenings of importance
9. Additional occupations as may be advisable

A brief statement as to how these activities were carried out during this period was given by Theiss, abridged from his report, as follows:

1. The weather conditions were recorded on blank forms furnished the party. During the daylight hours the velocity and direction of the wind, thermometer and barometer readings, the visibility and sky(cloud) ceiling were recorded once every hour. During the night... readings were recorded every three hours, and any unusual weather conditions noted. The amount of rainfall was also recorded in the daily log. These records are now (1974) preserved by the NOAA Environmental Data Service, Asheville, North Carolina 28801, for Jarvis, Howland and Baker Islands. Much more extensive records are preserved for Canton Island, with a summary of those concerning rainfall given in "An Atlas of Pacific Islands Rainfall," by Ronald C. Taylor, 1973.

2. The original coconuts brought by the party (from Palmyra Island) were not suitable for planting, being without the outer covering. They were, however, put in the ground. As was to be expected, they did not grow. The

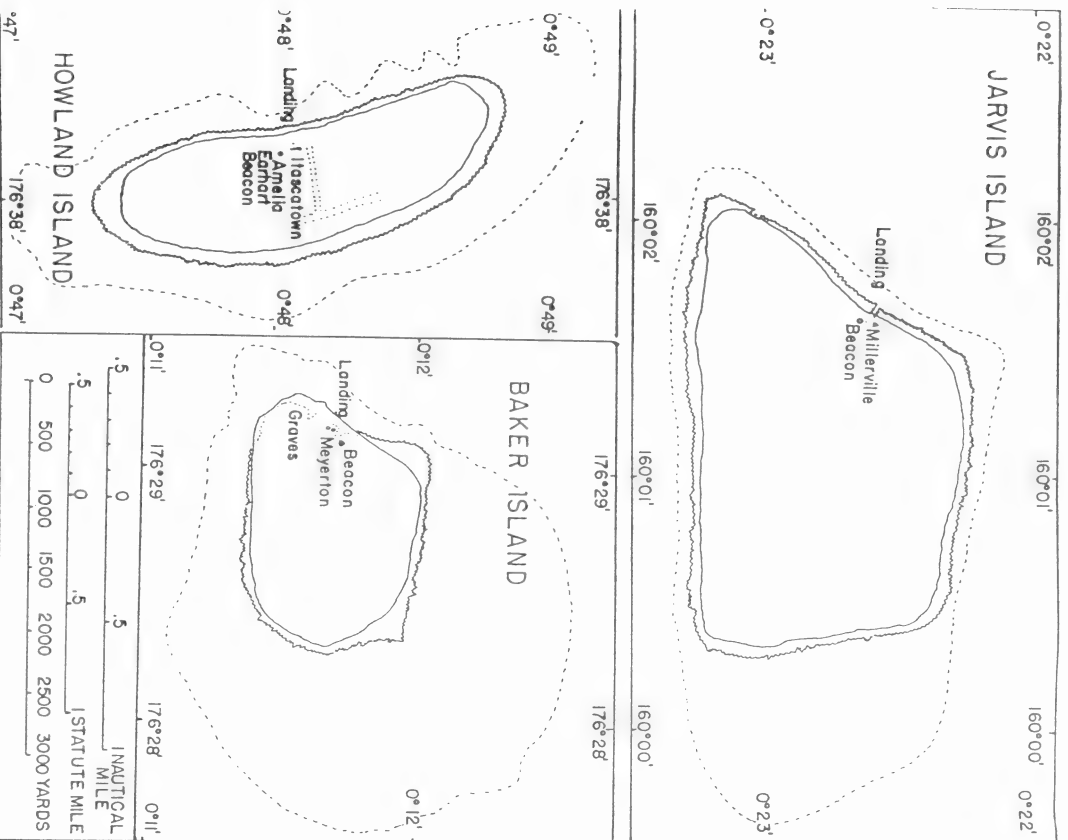


10. SCIENTIFIC DETAILS ABOUT THE ISLANDS

JARVIS ISLAND is located about 22 nautical miles south of the equator in the Line Islands. It is about 200 miles southwest of Christmas Island. It is a low, saucer-shaped coral island, measuring 1-3/4 miles east and west by a mile in greatest width. Its area is 1,024 acres, about 1.6 square miles. On the north, west and south sides the beach rises steeply from the fringing reef to a height of about 20 to 22 feet above sea level, forming a sandy ridge. The highest point on the island (23 feet) is on the northwest side. Seaward of this is a small break in the fringing reef, enlarged by blasting to facilitate landing. Here was located the colonists' camp, named Millerville in honor of William T. Miller.

The central portion of the island is depressed practically to sea level, in part the result of guano digging. The depression contours on the map, drawn by Chester K. Wentworth in 1924, are emphasized by the characteristics of soil and vegetation. The lowest, central portion is bare and generally moist. At times one would sink into it as one would walking across wet cement. Around this bare part, and up to a height of about five feet above sea level, the surface is covered by a meadow of pickleweed (*Sesuvium*), except for rough, bare flats from which guano has been sifted, leaving rows of coral rubble. The portion between 5 and 15 feet elevation is sparsely covered with herbs, of which purslane (*Portulaca*) is the dominant species, with scattered *Boerhaavia* vines and 'ilima bushes. The crest of the surrounding sandy ridge bears a narrow cover of *Lepturus* bunch grass.

In 1935, when the "colonists" first established their camp near the landing, there was a patch here of very dry "puncture vine" (*Tribulus*), eliminated because of its sharp thorns. And on the steep beach west of Millerville a few bushes of *Abutilon*, a large shrub resembling a fuzzy 'ilima (*Sida*). Both these plants doubtless had been introduced by visitors to the island, perhaps the guano diggers. The other plants on the island were of species found on most of



Maps of Jarvis, Howland and Baker Islands, drawn to the same scale, showing the fringing reefs and the limits of water less than 20 fathoms (120 feet) deep.

the drier islands of the Central Pacific (see list) and may have arrived by natural means.

The lower, outer edge of the beach is extended as a fringing reef, up to about a hundred yards in width. This dries at very low water. The water deepens gradually for another hundred yards or more on the north, west and south sides, and then drops abruptly to a considerable depth. However, off the east side is a large area of shoal water, which was sounded by the Itasca in 1935 and 1936. This shoal does not provide a safe anchorage, since the prevailing winds come from that direction; and the other three sides are so steep-to that ships cannot anchor with safety. Despite this, many of the sailing ships which carried guano from the island managed a "toe-hold" while loading guano; but on several occasions they courted disaster on jagged reefs should sudden shifts of wind occur. In smooth weather landing was not difficult at the break blasted through the reef on the northwest side; but on some occasions even the well-handled, self-bailing boats used by the Coast Guard found landing difficult here.

The history of Jarvis Island is given in my book, American Polynesia, so only the essentials of this account are repeated here.

Jarvis is said to have been discovered by Captain Brown of the English ship Eliza Francis, April 21, 1821. The island also has been called Bunker, Volunteer, Jarvis, and Brook or Brock, and some of these names appear on charts or lists of discoveries prior to 1821. Captain Michael Baker landed from the ship Braganza in 1835 and again in 1836, and from the Desdemona in 1845. The U. S. Exploring Expedition's ships Peacock and Flying Fish surveyed the island in December 1840.

It is stated that guano samples were taken in 1855. In March 1857, Alfred G. Benson, of New York, and Charles H. Judd, of Honolulu, landed from the Hawaiian schooner Liholiho (Captain John Paty) and claimed the island for the American Guano Company, under the Guano Act of 1856. A few months later the U.S.S. St. Mary's,

under Commander Charles Henry Davis, surveyed the island and made formal claim in the name of the United States.

February 27, 1858, C. H. Judd took 23 Hawaiian workmen to Jarvis on the ship John Marshall, Captain Pendleton, to commence digging operations. Buildings were erected and moorings laid. From 1858 to 1879 there is a continuous record of guano shipments from the island, making it one of the most extensively exploited of the guano islands. On July 26, 1879, the American schooner Joe Woolley, under Captain Benj. Hampstead, "took all the men and material on board" and sailed in turn to Baker and Howland, where the guano works of these islands were also closed.

On June 3, 1889, the island was annexed by Great Britain. In 1906 it was leased to the Pacific Phosphate Company of London and Melbourne, but very little, if any, digging was done.

On August 30, 1913, the barkentine Amaranth of San Francisco, C. W. Nielson, master, with a cargo of coal from Newcastle, New South Wales, for San Francisco, stranded on the south shore of Jarvis. The story of this mishap, and the effect that it had on the "colonists" later, is told in detail in Chapter 4 of this book.

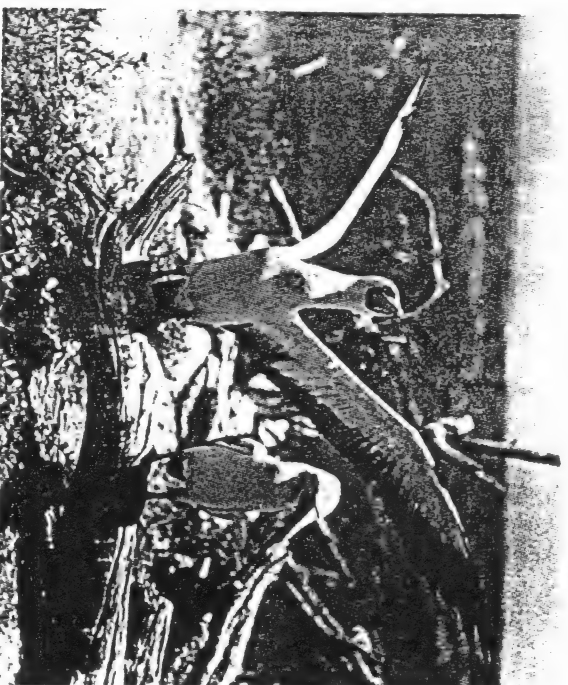
In 1924 a scientific party from Bernice P. Bishop Museum visited Jarvis on the U.S.S. Whippoorwill and made a biological survey of the island. At that time Dr. Chester K. Wentworth made a careful contour map of the island, now preserved in Bishop Museum. The accompanying map is based on this.

This brings the history down to March 26, 1935, when the "colonists" landed and the American flag once more was raised over Jarvis. In other parts of this book the history of this island is continued until the beginning of World War II, when the last of the "colonists" were withdrawn.

Even though uninhabited, the island continued under the jurisdiction and administration of the U. S. Department of the Interior. Yearly visits were paid to the island by U.S. Coast Guard cutters.

Jarvis was visited by a party of oceanographers, representing the Scripps Institution of Oceanography, during the International Geophysical Year, an 18-month period from July 1, 1957 to December 31, 1958. Harold G. Jewell, Jr., who now lives in Kaneohe, Oahu, was a member of the party for about 13 months. Mr. Jewell published an interesting account of his observations on Jarvis in the Hawaiian Shell News, volume IX (2), December 1960, to IX (4), April 1961. He was an enthusiastic shell collector, and gives identifications of many of his shells. In the April issue he speaks about his conversations, after his return, with various colonists who had been on Jarvis, especially Paul Gordon Phillips, who had been on the island from August 2, 1941 to the final evacuation of the island February 9, 1942. Mr. Jewell published a map of Jarvis, annotated with such information as the location of shell holes toward the eastern end of the island, which had been made by a Japanese submarine which had surfaced off the west shore of the island. The four "colonists" on the island, Bernard Hall, David Hartwell, Karl Jensen, and Paul Gordon Phillips, thinking that this was a United States Navy submarine that had come to take them off the island, rushed down the beach joyfully waving their arms. The submarine unlimbered its deck gun and commenced to fire upon the completely defenseless unarmed "colonists." Fortunately, owing to poor marksman-ship, no one was hurt. The "colonists" scattered and ran, hiding inland on the island.

Mr. Jewell also gives some notes on the geology of Jarvis. He says: "Close inspection of the topography... seems to indicate that the island was horseshoe-shaped with a lagoon opening toward the east. The lagoon gradually filled in and a low rim was built up on the east shore.... Gravity-metric measurements made on Jarvis during the I. G. Y. indicate a mound or peak underlying the island, of dense mass, probably volcanic basalt. If this is so, then Jarvis is a relatively thin overlay of coral limestone on a submerged, extinct volcanic formation. The surrounding [slope] drops abruptly to a fairly even ocean bottom at about 2800 fathoms (16, 800 feet), in all directions except to the east where the depth increases more gradually."



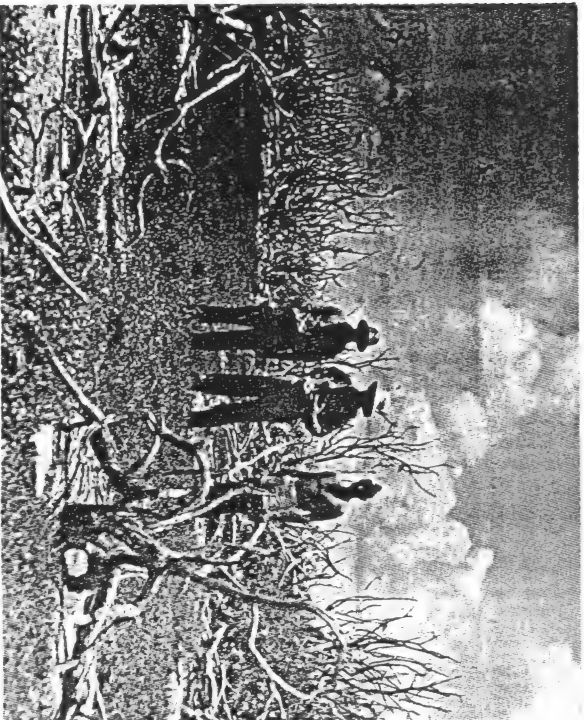
Boobies are always willing to play clown.



Frigates don't scare, but they are wary.



Albert F. Judd identified a plant, found on Jarvis by Private Graf, as a species of *Amaranth*.



The remnant of the *kou* tree "forest" on Howland is visited by members of a ship's party.

Mr. Jewell describes a violent storm that he experienced on Jarvis which started on January 14, 1958 and continued for days. It agrees closely with the storms described by the "colonists" during their stay 20 years earlier. Regarding changes in Jarvis he says: "In the Millerville landing area almost every evidence of the Hawaiian colonists has disappeared.... Only the very solidly built lighthouse is still standing."

Warren B. King presents an interesting note concerning the "conservation status" of Jarvis in recent years. It is based on the various visits of "POBSP" (Pacific Ocean Biological Survey Program) parties under the auspices of the Smithsonian Institution, Washington, D.C. He says: "The IGY scientists' house, a few sheds, trash, an old lighthouse, and a tramway are the only signs of human habitation remaining. The settlers brought cats with them, and these now feed on seabirds. Rats formerly occurred on Jarvis, but were probably extirpated by cats. POBSP personnel killed over 200 cats in 1964 and 1965, and in later visits in 1967 and 1968 eight or nine were seen in a day or two.

Jarvis has a large Sooty Tern colony numbering 1,000,000, and large populations of both frigate birds and the three boobies, e.g. 9,000 Blue-faced Boobies. Elimination of the remaining cats would make Jarvis among the most important seabird islands of the Central Pacific. There is presently no special protection afforded the birds." Dr. King credits this information to the POBSP unpublished reports and personal communications from Roger B. Clapp. (Conservation status of birds of Central Pacific Islands, The Wilson Bulletin, vol. 85, No. 1, March 1973; reprinted in the Elepaio, vol. 34, nos. 6, 7, and 8, December 1973 to Feb. 1974.)

HOWLAND ISLAND is low, narrow and elongate, shaped like a flattened weenie roll. It measures a little over a mile and a half, roughly north and south, by a half mile wide, with a land area of 0.64 square miles or 410 acres. The maximum elevation is about 18 to 20 feet. The entire western beach is low and sandy; that on the eastern, or weather, side a little higher and more abrupt, faced with

Tides—Currents.—See also the Line Islands description. The spring range here is about 7m (2 ft.).

Offshore, the majority of the sets reported are between NW and SW, with a large portion of the rates exceeding 1 knot. A rate of 2½ knots has also been reported. E sets appear to be infrequent from June to November, but may occur at other times, particularly from March to May.

A strong NW current along the atoll's N coast forms tide rips N of the atoll's NW extremity. A very strong W current sets onto the island's SE end.

During passages between Kiritimati and Tabuaeran Atoll in 1949, a vessel reported currents to be variable, but in no case exceeding 1 knot.

Anchorage.—There is good anchorage in 33m (18 fm), coarse sand, with Bridges Point Light structure bearing 110°, ½ mile distant. Anchorage can be found anywhere W or NW of Bridges Point; however, anchorage SW of the light should be avoided as abandoned moorings lie about ½ mile SW of it.

2.05 London (1°59'N., 157°28'W.) (World Port Index No. 56035) is located on the N side of the lagoon entrance, 3¾ miles SSE of the NW extremity of the atoll. The atoll is administered as a commercial plantation by the Government of Kiribati through a District Commissioner who is normally in residence here.

The current sets strongly into and out of the lagoon, and may reach velocities of 4 to 5 knots, but does not affect the use of the port facilities. From November to March, NW swells are frequent and at times cause lines of breakers across the lagoon entrance making passage by small boats hazardous and sometimes impossible. W swells and fresh E winds cause the most dangerous conditions. During flood tides with strong E winds, waves up to 1.2m (4 ft.) in height are produced.

Vessels proceeding to London Wharf should use Cook Island Passage, which has a least charted depth of 5.8m (19 ft.). London Wharf, about 370 feet long has depths of 1 to 2.5m (3 to 8 ft.) alongside. The approach channel has a limiting depth of 2.1m (7 ft.).

Caution is advised as depths less than charted have been reported (1979) in Cook Island Passage and London Passage. A sand spit E of the wharf is constantly changing.

The lagoon is shallow and studded with coral patches which makes navigation difficult, even for boats.

— **Jarvis Island** (0°23'S., 160°01'W.) is an island of sand and coral formation, situated about 202 miles SW of Kiritimati Atoll. The island is 1¾ miles long in a E and W direction and about 1 mile wide; it rises to a height of 6.1m (20 ft.).

A narrow fringing reef, which dries in places, and has breakers along the S shore, encircle the island. There are two breaks in the reef on the W side. A shoal with a least known depth of 4.6m (15 ft.) extends about 1,200 yards from the E side of the island. The depths drop rapidly outside the shoal area.

Jarvis Island is a United States possession, and in 1974 was declared a National Wildlife Refuge and was placed under the jurisdiction of the Fish and Wildlife Service.

Jarvis Island has been reported to give radar returns up to 7½ miles.

Malden Island (4°03'S., 155°00'W.) is triangular shaped, of coral formation, situated 375 miles SE of Jarvis Island. The island is a wildlife sanctuary under the control of the Government of Kiribati.

The island is about 5 miles long and 4 miles wide at its E end, with the apex on the W. It is about 9.1m (30 ft.) high, and visible for about 15 miles.

Malden Island is steep-to, with reefs extending from all its extremities for distances of 400 to 600 yards.

The settlement was situated on the N side of SW point and the ruins still remain.

Anchorage is in a depth of 28m (15 fm) off the W side, about 300 yards WNW of a tripod beacon, which is close SE of the landing place.

Currents.—Between Malden and Starbuck Island, currents with rates of 1 knot are usual, but may reach 2 to 2½ knots. Between September and November the highest rates occur, sometimes exceeding 3 knots. The usual direction of the set is W, but E sets have been experienced rarely exceeding 1 knot.

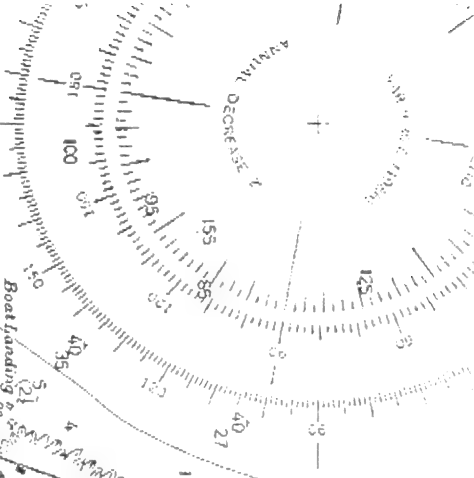
Caution is advised as no implicit reliance can be placed on current rates and direction. Great care should be taken when navigating in this area.

Starbuck Island (5°37'S., 155°54'W.) lies about 105 miles SSW of Malden Island. It is about 4.6m (15 ft.) high and has a few shrubs on its NW part, making it visible from aloft at a distance of 11 miles.

A fringing reef, a large part of it awash, surrounds the island; it extends about 400 to 600 yards offshore except off the E end, where it extends for 1,400 yards.

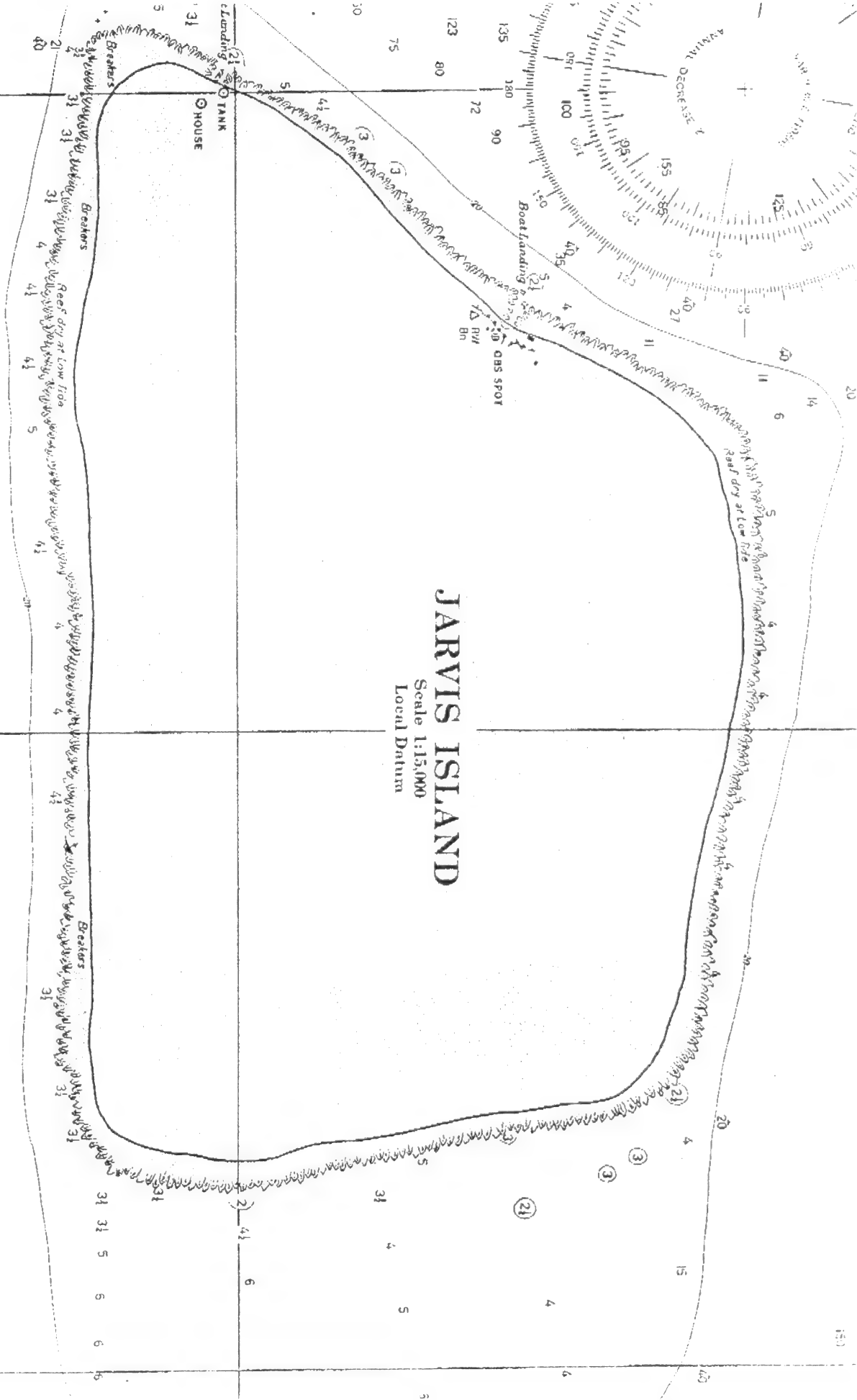
The approach to Starbuck Island, especially from the E, should be made with great caution, due to the currents in the vicinity of the island. The fact that the reef extending E is awash makes the strong W current dangerous.

Filippo Reef (5°31'S., 151°47'W.), located about 240 miles E of Starbuck Island, has been reported to be about 1 mile long in a NW and SE direction, and less in width. From the appearance of the breakers



JARVIS ISLAND

Scale 1:15,000
Local Datum



SOUNDINGS IN

02' 01' 160°

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX III

Jarvis Island (excerpts)
Official Log
March 25 - October 5, 1935

by

Wyman W. Graf

Geography and Map Collection
Bernice P. Bishop Museum
Honolulu, Hawaii

JARVIS ISLAND

(From the Official Log, kept by Wyman W. Graf, Private, 11th Medical Regiment.)

(March 25, 1935.)

Upon reaching the beach the party split up. Collins wanted to look around the island and directed that the others of his party stay at the landing to direct the placing of the first supplies as they arrived. He wanted them at a site near the beacon; evidently he had a camping site located. . . After a while, sitting quiet, I noticed hundreds of winged insects clinging to and flying about my trousers and feet which were wet with sea water. . . Aune joined me and together we watched the fish. We noticed a few small sharks . . . Just off shore beyond the breakers many porpoises were springing clear of the water and diving in perfect rhythm and formation.

. . . I proceeded inland and the first thing to attract my attention was a booby bird standing watch over a younger member. At my approach a fuss was made and after a few vicious snipes at my hat the "old lady" decided to fly away. I picked the younger one up and carried it to where another booby bird was sitting on a nest. Another fuss was made, but instead of flying away the "Old Lady" just backed away a few feet after bighting at my hat a while. I placed the young one over the egg in the recently vacated nest and the elder advanced and started picking on the helpless creature. The little fellow took it all rather calmly and, placing his long bill against his chest, just sat there. I saw a boat load of supplies arriving, so I took the "little one" back home and left him with the elder bird back on her ~~next~~ eggs and appearing relieved as well as contented.

Aune, the sailors and I unloaded the supply boat and placed it all on the beach, just out of reach of the water. The boat returned to the ship for reloading. The ship's captain directed that we put all food-stuffs in the shade of the beacon. Hundreds of hermit crabs were around the place.

It was exceptionally warm when we started moving things off the beach and toward the camp site, and we worked steadily until nearly sunset. Buff, Thiese and Wertz came ashore and brought coffee and sandwiches, which were stimulating.

Collins and Bryan pitched two tents and a fly about two hundred feet southward from the beacon. The site was somewhat low and beside a ridge of guano piles. This site was selected chiefly because of the protection from high winds.

With the coming of darkness, the ship lost its bearing on the island and signalled for a light. No lanterns or flashlights had been unpacked so a fire was built on the beach.

The last boatload of supplies for the day arrived and, with Mr. Bryan and Mr. Myers helping, they were moved up the beach to a place of safety from the surf. All things subject to damage by rain were sought and put under cover

We again had coffee and sandwiches and sat around and talked. Everyone was very tired. Mr. Myers gave a few final words of instruction and advice.

seemed to have an inexhaustible knowledge of birds. He gave the common and scientific name for all the birds he saw. Dan ~~was off fishing~~ and one member of the crew went out for lonsters, but were unable to get any; but they caught an enormous amount of aholehole. George and Frank helped the crew.

Dr. Coman and the Captain dined with us tonight. The name of the Captain is Constantine Flink. Down at the beach Dan, Frank and th crew were cleaning fish under the light of lanterns. The Doctor remarked that we treated them like a hotel did and they liked the food. The crew also had supper with us and everybodt seemed to enjoy the fish and food. Two of the Coman party will remaiñ on Jarvis: William Chadwick, ~~and~~ the radio man, and Louis Soares, a Kamehameha School student. Their camp is situated on the beach crest, about 200 yards from our cottage, right alongside the graveyard.

After supper everybody went aboard the Kinkajou for the night, including Dan and George. Henry, Frank and Soares were the only ones on shore during the night. On board the Kinkajou, Dan and George chatted with the crew and listened to the radio. They heard stations in New Zealand and on the Pacific coast. Now we believe that communications can now be had between Howland Island and the good ship Itasca.

September 2, 1935. Dr Coman, some of the crew, the radio man, and Don and George, who had spent the night on the ship, came ashore about 9:00 A.M. Dr. Coman had breakfast with us. as did the others who came ashore; the ship's cook went shell hunting. Dr. Coman said he never ate better pancakes. He showed his sincerity by having a message prepared to be sent to one of the Honolulu newspapers, in which there was an item about the pancakes.

Captain Flink did not come ashore; he became ill last night after supper. We hoped very much that it wasn't our food that disturbed him. Following breakfast, Henry escorted Dr. Coman, Mt. Chadwick and Mr. Soares to various places on the island; they collected samples of guano. That is the mission of Dr. Coman's party who are stationed on Jarvis. In the meanwhile Dan, Frank and George kept company with the crew who were with us in the cottage. The Kinkajou has a small crew. There is the first mate, chief engineer, three sailors and a cook, in addition to the Captain. When Dr. Coman returned, everybody went down for a swim except Mr. Chadwick who went to work on the radio apparatus. Dr. Coman took several pictures of the fellows swimming, and other pictures of the island. He swam also. The parting came at 11:30 A.M.; the send off was hearty. Dr. Coman once again expressed his appreciation of what he called hospitality. We were sorry to see the Kinkajou leave; we enjoyed their brief stay and liked everybody. The crew was all Hawaiian except the cook and a sailor. The Kinkajou had difficulty in getting up her anchor and putting up her sails. She took nearly an hour and a half doing so. She finally got uuder way at 12:12 P.M. By 2:15 she was completely out of sight. The Kingajou was going to Christmas Island, where she expects to meet the Islander who is bringing her more fuel. She ran out of fuel a long time ago. ~~She~~ only had enough for anchoring purposes.

In the afternoon Henry and George helped Mr. Chadwick, who was racing against time to get the radio apparatus hooked up for night traffic. He said he had some important schedules to meet tonight. By dusk everything was completed. We all had supper after this at our cottage, except Mr. Chadwick, who had to remain with the radio to keep his schedules. We practiced good neighborliness and brought his food to him. After supper we all gathered in the radio shack to hear whatever news there was. For some reason or other Mr. Chadwick did not meet his schedules. He did his part, but the people on the other end did not call him as they were supposed to. However, he did hear the Islander calling the Kinkajou. He tried to contact the Islander but was unable to do so. It might have been that they couldn't hear his signals. However, we did hear how the President spent labor day. Mr. Chadwick contacted KYG, Globe Wireless Co., at Kawaihapai, and KHK at Wahiawa. He relayed two of Dr. Coman's messages to KYG. The time signal given out by San Francisco Naval Station was received. We checked out clocks by this time and found them 15 minutes behind.

Mr. Chadwick and Mr. Saures have been having their meals with us so far. We have asked them to continue to do so until they become established. They have two tents up and a third one has just been put up. They have not been able to do more than ~~that~~ this because Mr. Chadwick has been very busy with the radio.

September 3, 1935. For the first time since leaving the Itasca we have had eggs to eat. We had eggs fried for breakfast, and some was used in our pancake dough. The eggs were given to us by the Kinkajou in exchange for a few cans of corn beef and ~~sauerkraut~~ sauerkraut. The letter of instructions telling us not to dispense with the food was not received until after the bargain was made. Fresh fruits, butter and rice were included in the exchange. Henry went over to the new camp this morning and gave the fellows a hand. They put up a tent, carried coral gravel and did other things. George spent the whole morning on the log. The coming of the Kinkajou gave him lots to write about. After lunch George and Henry observed Bill Chadwick do a little more work on the radio equipment and helped him a little. Frank and Louis went fishing; they caught three uhu, much enjoyed by Bill, who is a fishing enthusiast.

We gathered again at the Radio shack tonight. Bill sent two messages to our folks at home via an amateur in Honolulu. He also sent an article for publication, written by Dr. Coman, describing the arrival of the Kinkajou at Jarvis. The Itasca was also contacted, but Bill was unable to get Howland Island. The richest man on the Island is Bill Chadwick; his wealth totals \$1.13. The second wealthiest George West; his financial standing totals fifty cents. Next in order is His Excellency Governor-General Henry H. Ahia and Daniel Toomey, with one penny each. We are still estimating wind velocity. Bill says he will look over our instruments to see if he can locate the trouble.

September 4, 1935. Dan, Frank and George went over to the new camp again to give a hand. They have a large engine for charging batteries that had to be installed. This is the first internal combustion engine ever used on Jarvis.

Henry and Bill Chadwick went fishing and caught 2 uhu and 2 aholehole. While cleaning them, a stingray was almost caught; it was stabbed with a spear, but got away, spear and all.

At night we gathered in the radio shack, where we learned that the camps on the islands are to continue for another three months. The message also announced that the boys now on the islands desiring to return to Honolulu announce their intentions by radio as soon as possible. Howland was contacted for the first time tonight. The message received from Honolulu was also relayed there. The Itasca was also reached tonight and they confirmed the report that the camp will be continued. After experimenting a while, Bill was able to tune in on KGMB on the short wave receiver. During this reception, KGMB was broadcasting a Hawaiian program.

September 5, 1935. This morning Bill Chadwick gave us his assistance, and together with Henry and George, the anemometer and the wind velocity recorder were put in proper working order again. Bill was responsible for locating the inside trouble. The wiring of the buzzer was renewed and the armature was adjusted. The main trouble lay in the anemometer. There was a little spring attachment that was out of adjustment and it was fixed by Bill. . . The velocity of the wind is now [measured as] greater, and the interval between each buzz is even. Recently, it would never buzz more than 2 miles. Now, with the usual strength of wind blowing, it records as much as 16 miles. This reading is undoubtedly more correct and reliable. The total wind for each day should also vary. Instead of being 343.9 miles every day, it should be less on some days and more on others. After adjusting the anemometer, the dials were turned back to zero for a fresh start. For Sept. 5 it read 189.2 miles for a period of 19 hours.

Henry whitewashed the beacon this morning before lunch. Part of the afternoon was given to writing messages to Honolulu and Howland Island. Frank has decided to return to Honolulu; the rest are awaiting answers from Honolulu before deciding. Bill, Louis, Henry and George took a trip to the shipwreck.

As usual, we gathered in the radio shack tonight. There was no news except to hear of Howland Island's intentions. This morning there was a light shower, and two brief moderate rainfalls at night.

September 6, 1935. The beacon was whitewashed again this morning by Henry. The job is not yet completed; more lime is needed. Henry and George are working on the "lawn project." When the [surrounding] bricks are laid they will be painted. Louis and Dan went fishing. They caught uhu and aholehole. Bill Chadwick also went fishing with hook and line. He also caught uhu and an ulua, which we all enjoyed for supper. The evening was spent in Bill's radio shack. There was no news except for personal messages received. Howland was heard . . busy with Honolulu. We tried sleeping out in the open, just in front of the cottage. We never used to have rain more than once in two weeks; since August 31st it has rained or showered every day.

September 7, 1935. The supply tent must have met with strong wind opposition last night for this morning it was on the verge of falling. Henry and Dan spent some time attending to the situation. Henry put a table inside the cottage and arranged a stack of magazines on it neatly. The Kinkajou brought a large number of old magazines which now increases our lot of reading matter. Henry also hung up the turtle shell. Frank went fishing for a great part of the morning, He was not favored with a catch. Henry made a list of things he felt were needed on the Island and sent it to Mr. Miller. Other messages were either to Honolulu or Howland Island. The Itasca and the Islander were heard calling K6XJJ, which is our station. It was heard that the Islander would reach Christmas Island tomorrow. The Kinkajou is probably there now. The Itasca and the Islander could not hear our station. The total wind for 24 hours ending at 6:00 A.M. this morning was 329.1 miles, which proves the anemometer is in good working order. At 10:15 tonight it rained for a few minutes. A drum of water was tapped today. The old one lasted a week and a day. The arrival of the Kinkajou and it's stay of two days is, perhaps, a reason why this drum did not last the usual span of two weeks.

September 8, 1935. Last night, being Saturday night, we stayed up late . . chatting with Bill and Louis. We slept out in the open again, but this time under the shelter of the canvas that protrudes from the cottage. Corn beef hash for breakfast. Just before supper, Henry helped Bill, over at the camp, moving and reinstalling the Lauson Combustion engine. Dan, Frank and Louie went torch fishing. They caught 3 alaihi, a large mullet and a lobster. They were greatly menaced by sharks, and also the tide rose quickly. Henry and George went over to Bill's radio shack. All they heard was ^{that} the Itasca sails at 10:00 A.M. tomorrow. It drizzled at 5:20 P.M. and then rained from 5:55 to 6:11. The total wind read 392.2 miles. The instrument is still in good order.

September 9, 1935. Just before breakfast, Dan saw a small school of big fish that were swimming in the channel. Wishing to know what it was, he, Frank and Louis went out before breakfast. Using Dan's bug net they caught nine of the big fish, 13 mullet, and several manini. The big fish was 2 1/2 feet in length. Dan believed it was either aawa or oio. The catch attracted the entire Jarvis population. It was more or less a hukilau. The four of us took snapshots of the catch. Six sharks were also caught. It took all morning to clean the fish. Some of them were dried, and some we had for lunch. Henry got more lime and did more painting all day. Dan made a stairway of stones leading from the lawn to the beach. We visited the radio shack and learned that the Itasca sailed on schedule this morning for Jarvis via Palmyra.

September 10, 1935. Today's program consisted of different kinds of work around the camp: whitewashing the beacon, gravel for the lawn, and the start of a path to the new camp. Tonight we gathered at the radio shack, where Dan and Frank received

messages from Howland. Frank received word that arrangements for his entrance to the University of Hawaii had been completed, and now he is certain about returning to Honolulu. Dan was informed that his father spoke to his brother at Howland by phone transmitter. His family anxiously waits for his return. Dan, however, is not returning this trip. He and Henry are remaining. George is yet uncertain. He will know definitely when the Itasca arrives. We have also been asked to give names and addresses of people who we would like to have speak to us by radio. A program will be arranged this Saturday between 4 and 5 P.M. For the first time today we got a real close view of the "Quail bird". It walked proudly across the new lawn during breakfast.

September 11, 1935. Work on the stairway and path continued. George went out into the field for lime, and then painted the Bell Buoy. Frank kept busy shell hunting. We are now in the marked for a name for the new highway. George made a sign which said, "Road under construction, proceed at your own risk." At 5:35 P.M. Dan and George heard an amateur's radio phone program that was being conducted with Howland Island. Contact with Howland and the Itasca was made this evening; the latter said they expected to arrive Sunday or Monday. Four minutes of heavy rain after breakfast; also 20 minutes beginning at 3:45. Last night it rained heavily.

September 12, 1935. At 6:00 A.M. there began a heavy rain, with drizzles which lasted a long time. We were not able to have breakfast until a late hour. Rain also played havoc with our whitewash jobs. Dan completed the stairway by working on it all day. Frank and Louis indulged in fishing this morning. No catch. Henry made tidy the medical kit and improved the gardens. Out of the air came the this news: The Itasca will definitely arrive at Jarvis Sunday. Austin Collins is on board.

We sent names and addresses to Howland for the proposed radiophone program.

September 13, 1935. Henry and George hauled gravel for the path. Dan caught three lobsters during the morning. Frank journeyed across the island to take snapshots of the Amaranth. Bill and Louis made maps of Jarvis. We supplied them with information. In the evening we relaxed on the cottage porch. The moon was glimmering and the evening was delightful. Nothing significant about the radio communications. The Itasca's signals are getting louder. The new kind of Love bird, discovered on August 28, has been seen quite a lot. Maybe it has just migrated here; we are sure that we had never seen it before them.

September 14, 1935. Henry and George spent the entire day working to better the appearance of the camp. More lime, whitewashing the buoy again; cleaning, raking, painting the cooking table; tidied the cottage. George painted in red on two sides of the buoy - "Jarvis Island." Dan and Frank clipped each other's hair.

About 4:00 P.M. we all went over to the radio shack to hear a special radio phone program that was being conducted for our benefit. Friends spoke to boys on both Howland and Jarvis. Bill Chadwick's wife and son spoke to him. Louis heard one of his girl friends tell about the goings on in school. It was a real thrill to hear those

familiar voices direct from Honolulu. We were acquainted with most of the people who spoke to Howland and had just as much fun hearing them as did the persons to whom the talk was intended.

In tapping another drum of water this evening some difficulty was had. We could not get the faucet out. We were hoping that when the Itasca comes in tomorrow she would have a pipe wrench, for that seems to be the only tool that can unscrew the faucet. The reason why the drum lasted only a week is because Bill and Louis have been drinking water at our camp. They were afraid to drink their own water because they believed it is bad. As soon as the Itasca arrives they intend to have it inspected.

September ~~14~~¹⁵, 1935. Camp was straightened and put in tidy appearance. At 10:27 A.M. the Itasca was sighted coming from the northwest. It stopped about 500 yards off shore at 11:30 A.M. The first landing party consisted of Mr. W. T. Miller, Captain H. A. Meyer, Commander Derby, Sgt. Austin Collins (former Island leader) and a Kam boy, Theodore Akana. They were shown our new cottage by Henry Ahia, and commented on improvements since the last visit. Mr. Miller took pictures of the cottage, its surroundings and the personnel stationed here the last three months, namely: Henry Ahia, Daniel K. Toomey, Frank M. Cockett, and George N. West. Kenneth Bell and Jacob Haili will replace Frank Cockett and George West, who returned to Hawaii to go to college, Frank to the University of Hawaii and George to San Jose State. Henry and Dan remained for another three months. The last two were given permission by Mr. Miller to go aboard the Itasca to have lunch and visit friends. They were accompanied by Louis Suarez and Bill Chadwick of the Coman Expedition, and also Frank Cockett. The ships crew and others also came ashore and almost immediately set out for the shipwreck. They collected souvenirs. Some of the crew stayed to help with the unloading of supplies and water drums.

Captain Meyer, promoted to that rank from Lieutenant since his last visit to Jarvis, talked to Henry Ahia regarding our food supply, water, health and other things of importance.

The unloading of supplies and water was completed by 3:30 P.M., and all of the Kam boys came ashore to visit. They and the crew gathered at the cottage and different opinions were expressed concerning the island, the trip down, and of news in Honolulu. They returned to the Itasca about 4:00 P.M. The storing of our food supplies commenced immediately, and it was all safe within the shelter of the ration tent before sun-down. We had a hearty supper, prepared by Henry and Jacob and talked about news in Honolulu. We spent the evening playing the guitar and ukulele, and also went to Bill Chadwick's radio shack. Dan Toomey, Kenneth Bell, and Jacob Haili sent radiograms to their folks in Honolulu.

September 16, 1935. Perishable foods were looked over and put away. Henry Ahia

taught Jacob Haili and Kenneth Bell how to record the weather conditions accurately. We clipped eachother's hair in comical ways and then had it clipped short. The food supplies and equipment was checked. In the evening Kenneth journeyed to the shipwreck. After supper, Henry visited Bill Chadrick in the radio shack.

September 17. Up early; Jacob and Kenneth made a trip to the shipwreck before breakfast. Much of the day spent checking the inventory list. Henry and Kenneth went spear fishing with Bill Chadwick, catching a large mullet, but it~~x~~ was unfit to eat as its flesh had worms in it. About 5:00 P.M. two drums of water were hauled up and stored in the beacon. Henry and Dan received a radio message from Honolulu that their parents and friends would speak to them on Saturday at 5:00 o'clock via radiophone, made possible by Kenneth Lum King, radio operator on Howland with the Coman Expedition.

September 18, 1935. A double layer of wax paper was laid on the board roof of the cottage, and a canvas fly tent was put over the paper to hold it down, by Henry, Kenneth and Jacob. At about 4:30 they hauled up four water drums from the beach to the beacon. The evening's doings centered around the musical instruments - guitar, ukulele and harmonica, and singing. Henry visited Bill Chadwick's radio shack.

Nearly all day the sky was overcast with cirrus clouds and the wind blew from the south, very unusual for Jarvis.

September 19, 1935. Kenneth, Jacob and Henry visited the shipwreck to collect some lumber for firewood and to secure the steering wheel of the Amaranth. Its shaft is about two and a half inches in diameter. We filed on it quite a bit, but the shaft proved to be still sturdy and strong.

Just before lunch today two large fish were noticed by the group swimming around the bathing place. They were not sharks, but believed to be either oio or aawa. Dan's surrounding net was used to catch these fishes. Only one was captured; ~~the other~~ it measured 3 1/2 feet long, with a circumference of 2 feet 4 inches, and weighed 60 pounds; some was had for supper and some dried. The other went through the net. Henry, Kenneth, Jacob and Louis went fishing after lunch, uhu, u'u, aholehole, and three lobsters. Some was cleaned for supper. Two large sharks were also caught. Usual evening music and reading after supper.

September 20, 1935. Kenneth and Jacob seem to have adjusted themselves to their surroundings at this early date. They have fitted into the routine of duty in an excellent fashion. Two drums of water were hauled up to the beacon by the four of us after breakfast. Dan commenced to extract the jaws of the shark caught yesterday. The four of us and two from the Coman camp went spear fishing to keep up on our fishing technique. Many variety of fishes were speared. This evening Henry Ahia received word that Joseph Anakalea and Folinga Faufata were stationed on Howland, replacing William Toomey and William Anahu, who are returning to Kamehameha for the final year of their high school education.

Sept. 21, 1935. Hauled up three drums of water with the help of Kenneth, Henry, Jacob and Louis Saures. Henry journeyed to the shipwreck and surveyed the airfield to plan markers which would be visible from the air. After lunch Dan, Jacob and Louis visited the shipwreck looking for lumber to make surfboards. At 5:00 P.M. Henry heard his two brothers, Sam and Charles, speak to him over the radiophone. Dan heard his dad speak to him. They told of interesting happenings in Honolulu, such as football, boat racing, and personal family news. Tonight the usual musical session and visit of Henry to the radio shack. Between weather readings Kenneth made a spear with a six foot handle to ~~spear~~ spear sharka and large fishes.

September 22, 1935. Sunday, a day of rest. Dan, Kenneth and Louis visited the shipwreck for surfboard lumber. Dan cut his finger on a piece of rusty steel. After lunch Kenneth and Bill Chadwick journeyed three quarters of the way around the island, exploring the sea for fish. They came to the conclusion that northwest of the cottage was the best fishing site. Usual evening activities.

September 23, 1935. Kenneth, Jacob and Henry began work on the airfield. They did some ground leveling at the SE corner. They also began to construct a large T-shaped marker, 20 x 30 feet and 2 1/2 feet thick, to be visible from the air.

September 24, 1935. Two more drums of water hauled up to the beacon site; 13 to date and 6 more to be hauled. Just after lunch, a large school of fish about 3 feet long were seen swimming around the bathing spot. An attempt was made to ~~catch~~ catch some, but the surround net proved inadequate. Dan Toomey and Kenneth Bell brought over some lumber from the shipwreck for their surfboards.

September 25, 1935. Henry and Jacob constructed another marker on the extreme western side of the airfield. Dan journeyed to the shipwreck for more lumber. Afternoon spent in body surfing and swimming. Music in the cottage in the evening.

September 26, 1935. Henry did more filing on the steering wheel at the shipwreck. Also planned sites for T-markers at the airfield. Kenneth worked on his surfboard, the first to be constructed on Jarvis. It is 6 1/2 feet long. We all went surfing after lunch. Dan Toomey worked all day on his surfboard. It is about 12 feet long. Kenneth Bell and Louis Saures went to the shipwreck for more lumber.

September 27, 1935. Kenneth Bell caught a "quail" this morning and brought it back to the cottage. He intends to make a pet of it. The bird is quite tame, but shy of our presence. We named the bird "Oscar". Henry, Kenneth and Jacob hauled three drums of water from the beach to the beacon. After lunch the four of us went surfing. In the afternoon Henry and Kenneth went out into the field to catch love birds for pets. The captured two birds, one was all white, the other lavender in color. The birds were caught with a little scoop net.. Usual musical evening.

September 28, 1935. Kenneth Bell made a trip to the shipwreck for lumber before breakfast. He intends to lengthen his surfboard from a 6-footer to nine feet. Dan and Kenneth worked on their surfboards in the morning and went surfing in the afternoon.

Evening as usual: Henry Ahia to Chadwick's radio shack; others - reading and music.

September 29, 1935. Another Sunday. Surf riding in the afternoon. Evening, Henry Ahia visited the radio shack and heard a radio program between Honolulu and Howland. He heard some of his former schoolmates. Hearing that Dan Toomey's dad wanted to speak to him, Henry raced to the Cottage and got him and the rest of the group. Don Mitchell, of the Kamehameha school faculty, and various schoolmates also spoke, extending best wishes, for today was Dan's 21st birthday.

September 30, 1935. Inventory was taken of camp equipment, provisions and water supply. Kenneth Bell constructed dumb-bells and bar bells, using the old drycells as weights. He made them of different weights, ranging from four to nine cells on each. He established his gym headquarters in the camp supply tent.

Dan caught a "quail" at 4:45 A.M. He was awakened from his sleep by the whistling of the bird outside the cottage. It was caught and brought to the cottage with the idea of making a pet of it. Today was Henry Ahia's 23rd birthday.

October 1, 1935. Hauled the last two drums of water up to the beacon. Henry, with Lewis Soares and Bill Chadwick, walked around the southwest shore, collecting shells. Kenneth Bell walked around the island after lunch. All went surfing for an hour.

October 2, 1935. Jacob Haili went to the shipwreck and brought back six pieces of lumber to make into a bed, 3 by 6 feet, without legs. Dan Toomey worked on his surfboard. Kenneth Bell sewed a head strap to exercise his neck. In the afternoon he and Louis Soares journeyed to the N.E. shore to spear fish. Dan and Jacob began their "body-building" exercises. Henry and Kenneth also did exercises. Henry Ahia went to the radio shack and heard some girl friends talk to the boys on Howland.

October 3, 1935. Henry, Jacob and Louis hiked three-quarters of the way around the island before lunch. They collected shell and coral and played with the sharks at the north eastern end of the island. Kenneth Bell prepared some sturdy fishing line for shark fishing. In the afternoon Henry, Kenneth and Louis walked to the NE end of the island. There was the usual reading, surfing, guitar and ukulele playing, exercising and household chores. Henry went to the radio shack; the others organized the "Jarvinia Hot Shot Quartet."

October 4, 1935. Henry Ahia spent the morning collecting shells and coral on the eastern beach. Jacob Haili worked on a contraption to perfect his "U-Ma" ability. U-Ma is a Hawaiian sport [hand wrestling] whereby the strength of an individual's arm is tested. . . Both try to pin his opponent's ~~and~~ hand to the floor. Dan rigged up a lighting system using five dry cells, for reading at night. Kenneth cleared a path from the beacon to the supply tent, and began to draw a map of the island. In the evening a new drum of water was tapped; the last drum lasted a week. Usual evening activities.

October 5, 1935. Henry Ahia went shell collecting in the morning. He has a fine collection of shells to date. After lunch he made another shell hunting trip to the eastern beach with Bill Chadwick. Kenneth Bell went spear fishing on the eastern beach.

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX IV

Copy of QSL card

from

KG6NVJ

to

W8BKP

QSO with Jarvis Island
September 17, 1938

BURTON - HERE IS
 COPY OFF ONE JARVIS
 BEFORE YOU BOY DID LUCK
 FB JOG - 73
 GEORGE W8BKP

JARVIS ISLAND
 SOUTH PACIFIC OCEAN

KG6NVJ

To Radio W8BKP confirming our communication on Sept. 17 1938
 on 7 M. RST 579 10:05P HST

Remarks: Mrs Jarvis ord
 as arison delay tks
 Qsp as ord vy 73

ALEX WONG
 1450 MIDDLE ST.
 HONOLULU, T.H.

DATED
 SEPT 28 1956



Palmyra Island

W3ZJU

/KP6

John A. Hudick

DID NOT COME
 OUT TO BROD
 MAY 13 1946
 DXCC GAVE ME
 CREDIT FOR JARVIS
 PALMYRA FOR THIS
 CARD - PRE WAR
 Z

CHRISTMAS ISLANDS

Wm. S. Huebsch, Operator

W3WGY

HOME QTH 214 LOCUST, BUFFALO, NEW YORK

C. Fritz - Joliet, Ill.

Radio! Ur sigs Qsa R
 on 1943, at 11 m.
 Xmtx wts input. Recvrs Freq
 Ur Qsl will be appreciated.

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX V

QSL cards

from

AD1S/KH5 (1983)

and

AH3C/KH5J (1990)

DXpeditions



サマ

JARVIS ISLAND

AD1S/KH5

THE
DX
FAMILY
OF JAPAN



OPERATORS:

AD1S—GEORGE W4ZMOE—STU H44SH—STU
W0RLX—BURT BIOLOGIST, USFWS—CAM

STATION	MO	DAY	YR	GMT	FREQ	REPORT	MODE
	NOVEMBER						TWO CW
	7, 8, 9, 10, 1983						WAY SSB



CQ
ham radio



ICOM
First in Communications

JARVIS ISLAND
1990

AH3C/KH5J



APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX VI

Correspondence
FCC License
Special Use Permit

for the

AH3C/KH5J (1990)

DXpedition



United States Department of the Interior

FISH AND WILDLIFE SERVICE

P.O. Box 390
A.P.O. San Francisco, CA 96305-5000
November 8, 1989

Mr. Peter H. Grillo
P.O. Box 1139
APO San Francisco, CA 96305

Dear Mr. Grillo;

With this letter I would like to confirm in principle our commitment to the an expedition to Jarvis Island in April of 1990. This trip will be a joint venture between your group of amateur radio operators and the U. S. Fish and Wildlife Service. We cannot commit funds to the charter of the vessel, but we will provide one Refuge employee for two weeks and fund their transportation to and from Christmas Island, their expenses on the Christmas Island, and their share of food and supplies needed on the Island.

Our commitment is based on the following understandings:

1. We understand you are responsible for funding the boat charter and obtaining the vessel, but we will reserve the right to disapprove of a particular vessel if we believe the boat to be unsafe for such a voyage.
2. The expedition will be about a 10 day charter with plans to spend about seven days at Jarvis Island.
3. You will be organizing the amateur radio operators and all your necessary equipment. Also, you will make the expedition available to a variety of operators as this island is public lands and we can only accompany one such trip every other year. You will be limited to a maximum of eight persons.
4. We will provide advice on the charter vessel and logistics on Christmas Island and Jarvis Island.

I look forward to working with you on this expedition.

Sincerely,

Douglas J. Forsell
Wildlife Biologist

cc. Stewart Feder, USFWS

AMATEUR RADIO LICENSE		NOT TRANSFERABLE		
EFFECTIVE DATE 02/13/90	EXPIRATION DATE 02/13/00	CALL SIGN AH3C	OPERATOR PRIVILEGES EXTRA	STATION PRIVILEGES PRIMARY
NAME AND ADDRESS PETER H GRILLO 475B BLDG 18 JOHNSTON ISLAND JA		FIXED STATION/OPERATION LOCATION BLDG 30 JOHNSTON ISLAND JA		
THIS LICENSE IS SUBJECT TO CONDITIONS OF GRANT ON REVERSE SIDE				
 (LICENSEE'S SIGNATURE)		UNITED STATES OF AMERICA FEDERAL COMMUNICATIONS COMMISSION GETTYSBURG, PA 17326		
		FCC FORM 660 SEPTEMBER 1988		
		FEDERAL COMMUNICATIONS COMMISSION 		



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Jarvis Island National Wildlife Refuge

SPECIAL USE PERMIT

Station No. to be Credited

Permit Number

JAR-1-90 53192

Date

January 31, 1990

Period of Use (inclusive)

From April 11, 19 90

To April 25, 19 90

Permittee Name

Mr. Peter H. Grillo

Permittee Address

P.O. Box 1139
APO San Francisco, CA 96305

Purpose (specify in detail privilege requested, or units of products involved)

Visit Jarvis Island National Wildlife Refuge with up to six other amateur radio operators and charter vessel to set up ham radio station and transmit for approximately ten days.

Description (specify unit numbers; metes and bounds, or other recognizable designations)

Amount of fee \$ _____ if not a fixed payment, specify rate and unit of charge: _____

- ☒ Payment Exempt - Justification: **This is to be a nonprofit trip, thus, no fee is applicable**
☐ Full Payment
☐ Partial Payment - Balance of payments to be made as follows:

Record of Payments

Special Conditions

See Attachment

This permit is issued by the U.S. Fish and Wildlife Service and accepted by the undersigned, subjected to the terms, covenants, obligations, and reservations, expressed or implied herein, and to the conditions and requirements appearing on the reverse side

Permittee Signature

Peter H. Grillo

Issuing Officer Signature and Title

Douglas J. Forsell

Refuge Manager

HBJ-1-90

Special Conditions

1. Permittees are to be accompanied to the island by a U. S. Fish and Wildlife Service (Service) Representative. The service will fund the air transport of this employee, their expenses on the Christmas Island, and a equal share of food expenses not provided by the charter vessel.
2. We understand you are responsible for funding the boat charter and obtaining the vessel, but we will reserve the right to disapprove of a particular vessel if we believe the boat to be unsafe for such a voyage.
3. It is the responsibility of the permittee to see that all persons covered under this permit are familiar with the special conditions.
4. Site of camp and antenna placement will be determined by the Service Representative.
5. Fishing at the island will be limited to trolling for migratory fish. No Tridacna clams will be taken and no commercial activities are permitted.
6. All activities of the permittee, his assistants, and boat crew are subject subject to all federal laws, rules, and regulations governing National Wildlife refuges (50 CFR).
7. The taking of any animal, vegetable, or mineral matter, except as authorized by the Refuge Manager or the Service Representative is prohibited. Disturbance to any wildlife, except as authorized by the Service representative is also prohibited.
8. All clothing, gear, and materials taken onto the island must be inspected and found free of foreign plants, seeds, animals, and insects prior to entry onto the island.
9. The permittee is responsible for removing all trash and refuse resulting from his activities. No trash or pollutants of any kind will be dumped into adjacent waters.
10. The Service Representative will have the power to halt any activity which he feels constitutes excessive disturbance to the wildlife, the island, or the reef ecosystem.
11. We understand that this is a nonprofit expedition. An accounting of the expenses and income will be delivered to the Refuge Manager to ensure that individuals have not profited from the use of the Refuge.
12. The Federal government will not be held liable for any damages to property or injuries resulting from the conduct of the operations.

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX VII

Expedition Report

Jarvis Island National Wildlife Refuge

by

Mark Rauzon
June, 1990

Expedition Report: Jarvis Island National Wildlife Refuge
by Mark J. Rauzon

Itinerary:

11-13 April, 1990- Enroute to Jarvis Island via Air Tungaru to Christmas Island. Enroute to Jarvis Island onboard S/V Makanalani.

13-22 April, 1990- Jarvis Island

22-25 April, 1990- Enroute to Christmas Island via S/V

Makanalani. Enroute to Honolulu via Air Tungaru

Personnel:

Mark J. Rauzon, Biologist with Hawaiian and Pacific Islands National Wildlife Refuge.

Eight Ham Radio operators who sponsored the expedition include:

Peter Grillo- USA- organizer

Martti Laine- Finland- co-organizer

Pertti Turunen- Finland

Jim Duffy- USA

Wayne Mills- USA

Masahiro Senda- Japan

Eric Scace- USA

Toni Zimmer- USA

Three crew of the S/V Makanalani include:

Tony Clarke- Captain

Catheleen Hanna- First Mate

Joe Kollars- Mate

Results:

Jarvis Island was sighted the morning of 13 April. The landing on the west shore was uncomplicated. Supplies and equipment were unloaded on the beach during calm surf conditions. The site by the Refuge sign was used as the base camp. The radio operators erected three antennae with guy wires. The tallest antennae was about 30 feet. A diesel generator to supply power for broadcasting was set up on the coral berm. A second camp site was established approximately 1500 feet inland (east) between two guano spoil piles. Two antennas were erected next to two tents. The USFWS camp was established adjacent to the Day Beacon. No birds were nesting near any of these camps.

The S/V Makanalani anchored on the sandy bottom about 300 feet offshore and moved to 2-10 miles offshore when the winds shifted to the north.

The crew caught about six yellow-fin tuna and one gray reef shark during their stay in Refuge waters.

Within six hours of landing, the radio operators began broadcasting. They continued their efforts 24 hours a day from 13 to 22 April. During this period they contacted approximately 52,000 stations around the world. They had very little impact or interaction with the wildlife of Jarvis. No birds were affected by their presence and the site was left free of debris when they departed. Two operators (Scace and Zimmer) were escorted around the sensitive areas of the island. They were recording video for

possible use in a Washington D.C. TV station documentary of their project. The history of the island and the wildlife were discussed and taped for possible inclusion the segment.

Island Vegetation:

Jarvis Island was very green due to recent rains. All plant species were in bloom and the vegetation was lush compared to past visits. *Tribulus* was especially verdant and in bloom with yellow flowers. *Tribulus* grows vigorously around the perimeter of the island (see Fig. 1). It also grow inland in scattered clumps.

Lepturus repens was growing from established grass tufts as well as from seed. *Lepturus* grows in slightly poorer drainage than *Tribulus* tho these plants create a mosiac in areas of intermediate slope (see Fig. 2). Dry tufted clumped were also present.

The orange-yellow flowers of *Sida falla* grew from established plants scattered throughout the higher elevations of Jarvis. Numerous dead shrubs about 1 to 3 feet tall were used as roosts by boobies and frigatebirds.

Abutilon is a conspicuous tall shrub on Jarvis. The importance of this plant has been underestimated or attributed to *Sida*. Tall skeletons of *Abutilon* cover a significant portion of the northeast portion of the island. A 'dead zone' of *Abutilon* skeletons contain no other plants species. Stems up to six feet tall are present and are used by boobies and frigatebirds as roosts. In the past, this plant has rarely been recorded. Mistaken for *Sida*, *Abutilon* is more dominant and perhaps spreading. This species is believed to be introduced (Bryan, 1974).

Sesuvium portulacastrum L. forms extensive mats in the lowest levels of the vegetated areas. Since Jarvis is a saucer-shaped atoll, the interior is depressed and collects water which in turn supports the plants. They are especially prevalent surrounding the salt pan at the islands' center. In other areas, individual plants form a circle mat. Dying plants are characterized by blackened portions that may have been chewed by house mice.

Eragrostis whitney Fosberg is rare and occurs as scattered plants in dry empty hard pan areas. This grass was observed and photographed flowering.

Boerhaavia diffusa grows in well-drained coral berms. Pink flowers sprouted from many plants.

Portulaca lutea also has yellow flowers. It grows in well-drained areas and on portions on the coral berms. This plant superficially resembles *Sesuvium* but occurs in different areas in much smaller numbers.

INSECTS

A cursory survey of insects was made. The following types were noted:

Ants- very tiny ants were found. They do not appear to attack bird chicks like the ants on Laysan Island, HI.

Crickets- locally abundant living under rocks and boards. Active at night

Cockroaches- large 2 inch winged species feed at night on Tribulus and Lepturus. A smaller species (in-stage of the larger variety?) was also noted.

Flies- very rare, noted especially near the end of trip.

Fruit Flies- noted in small numbers.

Dermeid beetles- abundant especially at dusk as they disperse to carrion.

Assassin Bug- type of similar species which bites humans was common around tent area. Apparent preys on millers.

Moths- Abundant, several species were noted. The abundance of moths and millers may have prompted the naming of Millersville of the old maps of Jarvis in the location of the Refuge sign.

Millers were especially abundant in the flowers of the Tribulus.

Larger moths were common at night around the radio operators lights. They became a pest to the radio operators.

No doubt many other insect species exist on Jarvis.

REPTILES

One morning gecko (*Lepidodactylus lugubris*) was observed at the old weather station. Two unidentified sea turtles were seen by the boat crew while at anchor. No sea turtle tracks were seen on land.

BIRDS

The number of species breeding on Jarvis is currently higher than at any time previously recorded. In the 60's, eight species were recorded breeding (POBSP records). In 1986, ten species nested. Now, 12 species nest on Jarvis Island (see Fig. 3). The response to decreased predation pressure is obvious because of the nesting of the smaller birds; those more prone to predation.

Species Accounts

Red-tailed Tropicbird (*Phaethon rubricauda*)

Red-tailed tropicbirds were incubating eggs. Only one newly hatched chick was located after looking at over one hundred nests. The estimated total of nesting tropicbirds is 111. Probably another 50 nests are present under bushes and coral rock which were not located. Surveys are mid-day during tropicbird display flights counted 45 in flight around the island. Thirty-five nests with eggs were staked for nesting productivity. Surveys planned for June/July would have determined how many eggs

hatched and how many chicks survived. These follow-up surveys will not be able to take place as planned.

Masked Booby (*Sula dactylatra*)

Masked boobies were not nesting during this visit. Large dark-headed fledged young still dependant on parents for food were present. About 5% of the chicks censused were large downy birds with feathered scapulars. Roughly the same amount were large fully feathered chicks which were dead on the ground, apparently having starved recently. I attempted to count all the large chicks around the island and found 458. Perhaps another 50 remained undetected. One nesting booby was found with one egg. Boobies nest primarily in the band of tribulus that surrounds the island just inland of the coral beam and island rim.

I also attempted to count the roosting boobies at night in the clubs near the salt pan. Only 1500 roosted here at this season. More have been recorded here during other periods and visits. At night, I also examined roosting boobies to see if any banded birds remained. I examined over 600 birds and found no bands.

Brown Booby (*S. leucogaster*)

Only three brown booby nests were found. However, one nest contained five eggs! Another had three eggs, so initial productivity seem quite high. It appears that nesting is just commencing with brown boobies. But there were over 100 juvenile plumaged boobies roosting along the shore and inland on coral beams. Two light-plumaged brown boobies were found near each other at night on a coral berm. These are males of the subspecies *brewsterii* which breed primarily in the eastern tropical Pacific (Clipperton Island). Forsell reported that one breeds with a normal colored bird on Johnston Island which is ever further west than Jarvis.

Red-footed Booby (*S. sula*)

Red-footed boobies were in several stages of development. Nests were under construction. Six nests had one egg each. Eleven chicks from downy to downy with scapulars and remeges were present. Juveniles in brown plumage roosted among adults. About 1000 red-footed boobies roosted in many small groups in the dead and living *Sida* and *Abutilon* bushes. Polymorphic boobies ranged from all brown to white with black wings.

Great Frigatebird (*Fregata major*)

Counts of Great Frigatebirds are similar to the 1986 survey by Forsell. He recorded 167 nests and territories. I found 174 nest and territories. Twenty-one nests contained eggs (18 of these were marked for further investigation into breeding success).

Chicks ranged from newly hatched to downy through chicks with scapulars and remeges.

Several colonies were established. The main colony was immediately south of the salt pan in the center of the island. Peripheral colonies were west of north of the main colony. An isolated group of frigates bred in the dead Abutilon in the east section of the island (Fig. 2).

Lesser Frigatebird (*F. ariel*)

One colony existed north of the great frigatebird colony by the salt pan. It contained about 3000 birds nesting in densely packed groups on the group. By counting eggs in a portion of the colony, I estimated about 600 eggs were present. An additional 162 rufous headed juveniles roosted on the periphery of the main colony. These were last season progeny still dependant on adults for food.

Forsell visited Jarvis in April as well. He found 609 nests, 99% with eggs. Kepler (1983) speculates that lesser frigatebirds initiate in March and April and peak in May or June. Since only 1200 of the birds had committed to breeding by April 1990, over half of the observed population could also potentially breed this season. However, since only 162 young of the previous year are present, assuming they represent a similar effort from the previous year, it is reasonable to assume that 600, not 1200 eggs, are laid.

Sooty Tern (*Sterna fuscata*)

Sooty terns were not breeding at this time. Small numbers (220) of fledged but dependant young were present at old colony sights. The mostly black young were periodically attended by adults and served as core crew for swarming terms. During the period of observation, sooty terns increased in number in the evenings and hovered in a semi-circle around the island. At night, several thousand were on the ground. It appears that a new cycle of breeding is commencing and fits with observations by Forsell in April 1986 when he observed newly formed colonies with eggs as well as colonies with newly hatched chicks.

Gray-backed Tern (*S. lunata*)

Gray-backed terns appear to have benefited from the removal of cats from Jarvis. Previous visits have recorded only 18 individuals, though Forsell (1986) discovered 4 eggs. Gray-backed terns are difficult to census but I estimate that about 50 pairs with eggs bred on Jarvis this April, 1990. Several nests were discovered to confirm nesting. They choose to nest in *Tribulus* around the coral berm in habitat shared by masked boobies.

Gray-backed terns were observed flying low over the *Tribulus* and suddenly dipping and picking moths from the flowers. They repeated this behavior as they flew over their breeding territories. Activity increased towards sunset when the moths became more active but this feeding behavior was observed at different times throughout the day. Insectivory in gray-backed terns was previously limited to the marine water strider (*Halobates* spp.) (Harrison, 1990) but may now be extended to the terrestrial moths. This behavior is clearly adaptive to utilize temporal resources of the terns' environment.

Brown Noddy (*Anous stolidus*)

The brown noddies were breeding around the northern portion of the salt pan. They occurred in about the same numbers and location as when Forsell (1986) observed them. At least 47 nests were observed. It is difficult to be precise in counting the birds since the colonies are scattered in *Sesuvium*, *Lepturus* and *Sida*.

One colony was discovered in the quarry area on a ridge of guano. Another colony occurred on the coral berms inland from the northwest shore. About 90% of the observed nests contained a single egg. Pipping eggs were noted as were newly hatched chicks. Several old fledged juveniles roosted on the periphery of the colony. It appears that this species is recovering from the predations of cats and is growing and spreading into new nesting habitat.

Black Noddy (*A. minutus*)

Four individuals were noted. Three roosted at night with brown noddies and one roosted in a hole at the day beacon. There appears to be no nesting habitat for these birds on Jarvis Island.

White Tern (*Gygis alba*)

White terns are present on Jarvis in very low numbers. Their breeding has yet to be confirmed. I saw one perched on coral rock but without an egg. At other times, a pair roosted at the day beacon in the evening.

Blue-gray Noddy (*Procelsterna cerulea*)

Blue-gray noddies were confirmed for the first time breeding on Jarvis Island. A colony of about 36 birds flew in alarm when I approached their breeding site. I located one egg to confirm breeding and estimate that about 11 pairs had eggs. The birds are the dark morph which also breed at Christmas Island. Other pairs of blue-gray noddies were seen prospecting other and distinct

areas, Single scattered nesting pairs may occur in suitable habitat around the island. The breeding habitat is characterized by a mosaic of broken gray coral, *Lepturus* for shade and *Sida*. During past visits, blue-gray noddies have been recorded and may have possible bred. However, the conspicuous presence of noddies on Jarvis are indicative that cat predations are very limited.

Wedge-tailed Shearwater (*Puffinus pacificus*)

Shearwaters continue to breed on Jarvis Island at approximately the same levels as measured in the past (Woodside, 1963). They have been recorded from 1982 calling from burrows. Apparently cats have had an impact in the past. One cat was pulled out from a shearwater burrow head first in 1982 (Rauzon 1983). Kepler (1983) also recorded moaning shearwaters and estimated fewer than 20 used the island. In 1986, no shearwaters were recorded and the burrows appeared to be unused (Forsell, 1986).

Wedge-tailed shearwaters called from burrows, sat in pairs and as individuals on the *Sesuvium* mats in the colony. I counted 67 burrows but could not determine the percent of occupancy. One burrow appearing unused was accidentally collapsed and a shearwater scrambled out. About 25 dark-phase wedge-tailed shearwaters were counted at the colony. This population is within the range of the past populations. However, the burrow count indicates that the colony is larger than the observed population.

Christmas Shearwater (*P. nativitatis*)

For the first time on Jarvis Island, christmas shearwaters were recorded. Six birds in three pairs, were observed at night on the periphery of the wedge-tailed colony. Two birds descended into a burrow when I approached. Breeding is suspected but not confirmed. One individual was seen flying in the early morning hours in a different area of the island. Individuals or pairs may occur in other areas outside of the wedge-tailed shearwater colony.

Bristle-thighed Curlew (*Numenius tahitensis*)

A group of ten curlews were closely observed on the south beach near the Amaranth monument. No marked birds were seen. On subsequent occasions, pairs or individuals were seen around the island. Sooty terns and brown noddies were mobbing curlews as they flew since curlews are known to predate eggs of these birds.

Wandering Tattler (*Heteroscelus incanus*)

Individuals and pairs were seen daily around the island on beaches and rocks exposed by the tide. Perhaps as many as 50 were present. The possibility that some individuals were Gray-tailed

Tattlers (*H. brevipes*) is likely. Winter and summer plumages were noted.

Lesser Golden Plover (*Pluvialis dominicus*)

Twelve birds in winter and summer plumage were seen on 4-14-90 along the south beach. On 4-17-90, four flocks totalling 117 were seen flying from the south of the island to the north in flight formation. It appeared that they were preparing to migrate.

Ruddy Turnstone (*Arenaria interpres*)

Five turnstones were seen feeding on the rocks at low tide along the south shore. They were in breeding plumage.

MAMMALS

Bottlenose Dolphin (*Tursiops truncatus*)

Approximately 100 dolphins inhabit the waters outside of the reef. They repeatedly accompanied the ship when it moved.

House Mouse (*Mus musculus*)

Mice were common in the early morning, evening and at night across the island. They live in burrows in the sand and under rocks and plants. The mice were agile and wary, quickly diving into their burrows when approached. It appears that they have some impact on the *Sesuvium*. Dead, blackened branches of this plant showed gnawings but their effects should be considered minimal.

Woodside (1983) reported abundant mice. They appeared by the dozens to eat from the frying pan and lined up at the salt pan waters to drink. Mice were not as visible on this trip.

Cats (*Felis catus*)

Feral cats persist on Jarvis Island. Cats were last seen in 1983, and were assumed to have been exterminated (Rauzon, 1983). The last visit to look for cats was in 1986 (Forsell, 1986). No cats were seen, however, only one night was spent looking for cats. On the first visit at night (4-13-90) into the guano quarry, I detected eyeshine. After twenty hours of hunting, I never saw more than one cat. The cat(s) were wary and did not allow close approach. On the first two nights it was sighted. The third night when the captain joined me to hunt, no sightings were made. The fourth night I was able to see a gray cat but not get a shot. However, I was able to get a shot the next night at fairly close range (<50 feet) with a birdshot shotgun. I thought I hit the rear right leg but the animal escaped. Two nights passed without

a sighting. At this time I looked at other areas of the island where cats were seen and shot in 1982. No cats were seen along the southwest and northwest coral rocks, nor along sooty tern roosts along the south inland coral berm, the salt pan or the north inland coral berms.

The next night, I got a close shot but missing since the cat was only showing its head from a burrow in the quarry walls. I located the extensive quarry den and sealed the two entrances. I did not see any cats on the next two nights in the quarry or in the inland areas.

In my last hours on Jarvis Island, I was assisted by crewman Joe Hollars, in smoking out the cat dens. I unsealed the den known to contain a cat and saturated the entrance with diesel fuel. The black smoke permeated the extensive network of tunnels in the guano quarry walls. A gray cat ran out through the fire and appeared to be limping as it ran. I fired at it as it ran and may have hit it. The cat entered another tunnel where I had previously shot at it before. We burned the entrances and the cat did not reappear. The entrances were sealed and one tropicbird was discovered. Its tail was singed and it breathed with difficulty. This indicated the smoke and heat damage to the lungs probably affected the cat as well. The cat probably died of smoke inhalation and gunshot wounds.

Woodside reports that he last saw one gray cat on Jarvis Island in 1983 in the coral rocks along the south shore. This may have been that cat which persisted seven years. I noticed cat scat piles which could have been made by one cat over the intervening years. Dead sooty terns were also found along the periphery of the grasses at the edge of the quarry. Since cats have not rebounded after their populations were reduced, it seems to indicate a very small population may contain same-sex animals. It is also possible that the feline enteritis virus still is viable and controls the cat population. The fact that there were no unwary cats appears to mean that new animals have not joined the population.

Further efforts to complete the eradication should include trapping with Conibear traps at the entrances of burrows and tunnels in the quarry walls. Hunting alone at such low densities is ineffective and temporal. Traps are effective 24 hours a day. Burning and smoking is an effective tool to remove cats from the burrows. This should be done towards the end of the visit to allow for traps to work and to produce bodies for analysis and proof of success.

INFRASTRUCTURE

The day beacon has disintegrated significantly. The cement at the top is cracked and falling. The iron poles cannot support any weight and are likely to fail. The ladder is derelict and unsafe. I left it standing since it was part of a potential national historic landmark. But subsequent trips should remove and replace it. A radio reflector should also be established on top of the day beacon to enhance the radar image of Jarvis. This cheap addition could prevent grounding which may potentially re-introduce rats and cats to Jarvis Island.

The Amaranth monument has a large crack as reported by Forsell, (1986) and does not need attention at this time. The Refuge sign uprights are in good condition. Refuge sign boards show termite damage and will need replacement in about five years. There is only one metal Refuge boundary and warning sign still standing. The weather station on the east shore stands. It is a good landmark as well as critical habitat for hermit crabs. It should not be burned as it contains two bottles of water and is a source of shade for shipwrecked people.

There was no evidence of unapproved visits. However, the captain of the S/V Makanalani reports that he heard that fishermen visit Jarvis Island waters from Honolulu to fish for lobster and tuna. We saw no other ships within hundreds of miles of Jarvis. Two giant tuna motherships were seen at night, (evading radar) closer to Christmas Island.

CONCLUSION

The most important observations from this trip are the additional breeding species and the expansion of the extant breeders. The presence of cat(s) after assumed eradication is disappointing. However their predation appears to have little effect on the expanding bird colonies. This indicates that the relictual cat population has little impact on the birds.

Future visits as soon as possible should follow-up on the eradication efforts. Smoke bombs used in conjunction with Conibear trapping and hunting should continue to keep pressure on the cat population.

Bird surveys at this time of the year appear to be most useful in determining the species composition of the island and the phenology of the species, excluding sooty terns and masked boobies. These two species which are the primary breeders in numerical terms are well-documented. The chance to visit Jarvis when they are not breeding is timely. Counting those numerous species is time-consuming and takes away from studying the more scarce species.

Sharing rides with special charter groups is also a good way to visit this especially remote island. Ham radio operators are likely to want to visit Jarvis again in about five years. Their desire to visit should be accommodated because it provides the Refuge with a multiple use purpose with virtually no impact on the island wildlife and resources.

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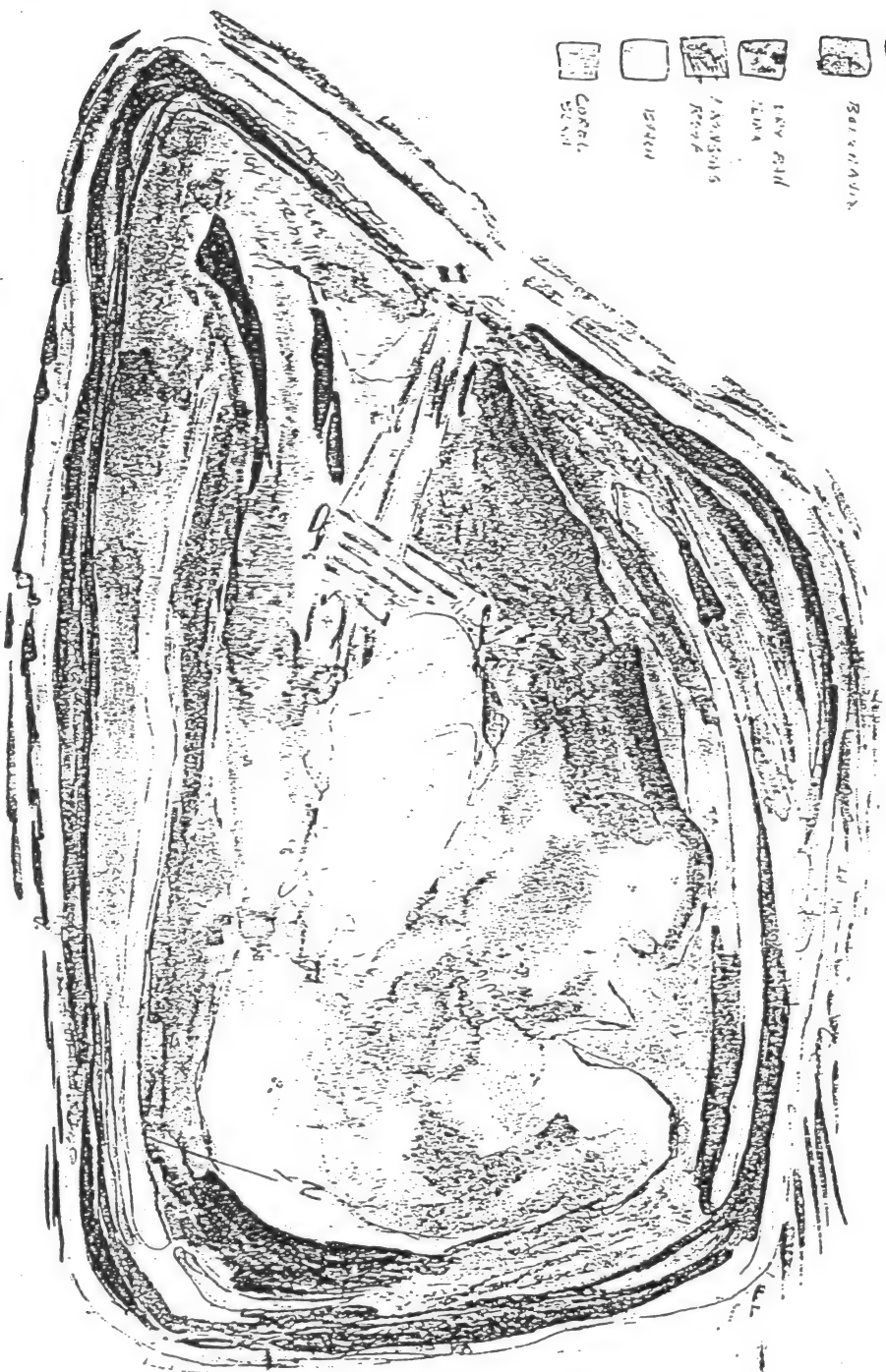
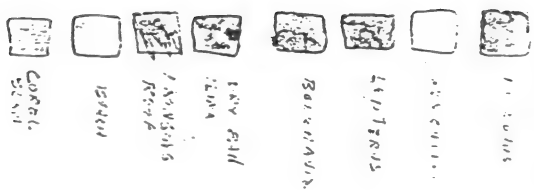
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SAND
 Lepturus
 Boerhaavia
 Tribulus
 Lepturus
 Sida
 Abutilon
 Crassostis
 Tribulus
 Sesuvium
 Abutilon
 Sesuvium
 SALT PAN
 SESUVIUM
 CRASSOSTIS
 Boerhaavia
 Tribulus
 Lepturus
 Tribulus
 Tribulus
 Coral Bar.
 Boerhaavia
 Abutilon
 Sida
 Tribulus
 Lepturus
 Boerhaavia
 Tribulus
 Lepturus
 SAND

FIG 1: KEY TO MAJOR VEGETATION TYPES OF JARVIS ISLAND NATIONAL WILDLIFE REFUGE



AFTER WOODSIDE '83

Fig 2: ELEVATIONS of JARVIS ISLAND.

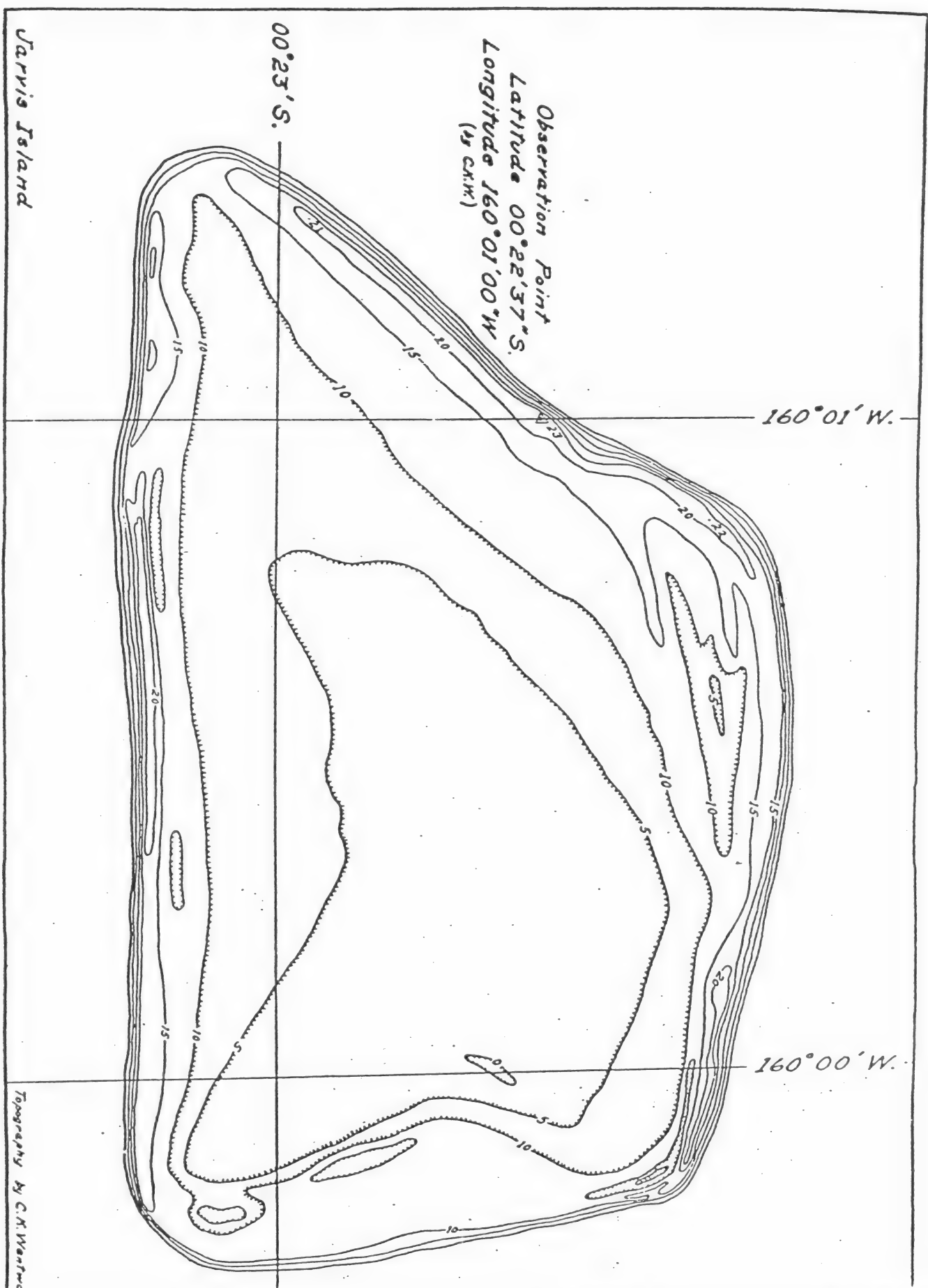
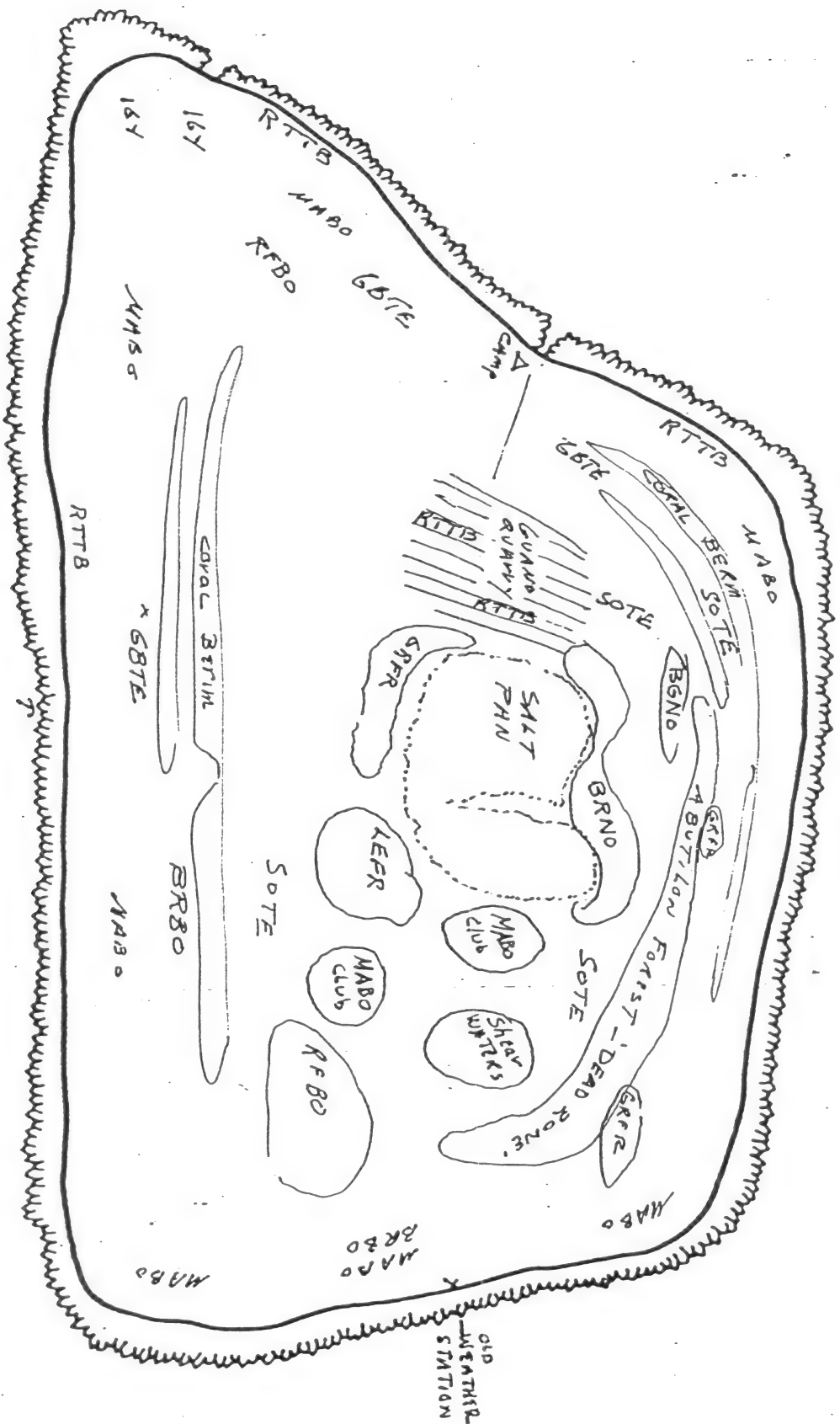


Fig. 3: MAP of BIRD COLONIES on Jarvis Island



APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX VIII

Map

Pacific Island Nations and their 200 Mile Exclusive Economic Zones

by

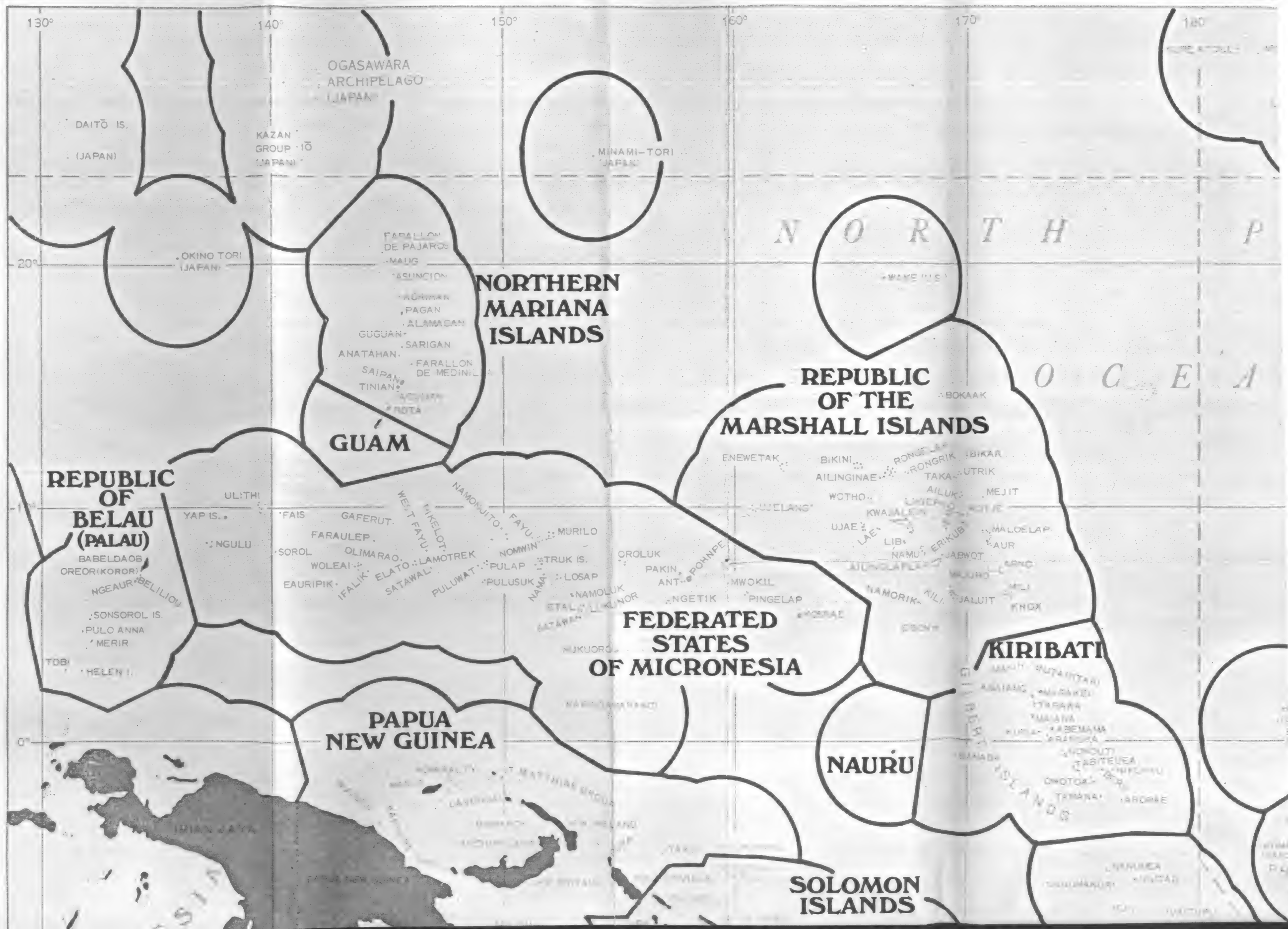
State of Hawaii

Department of Business and Economic Development

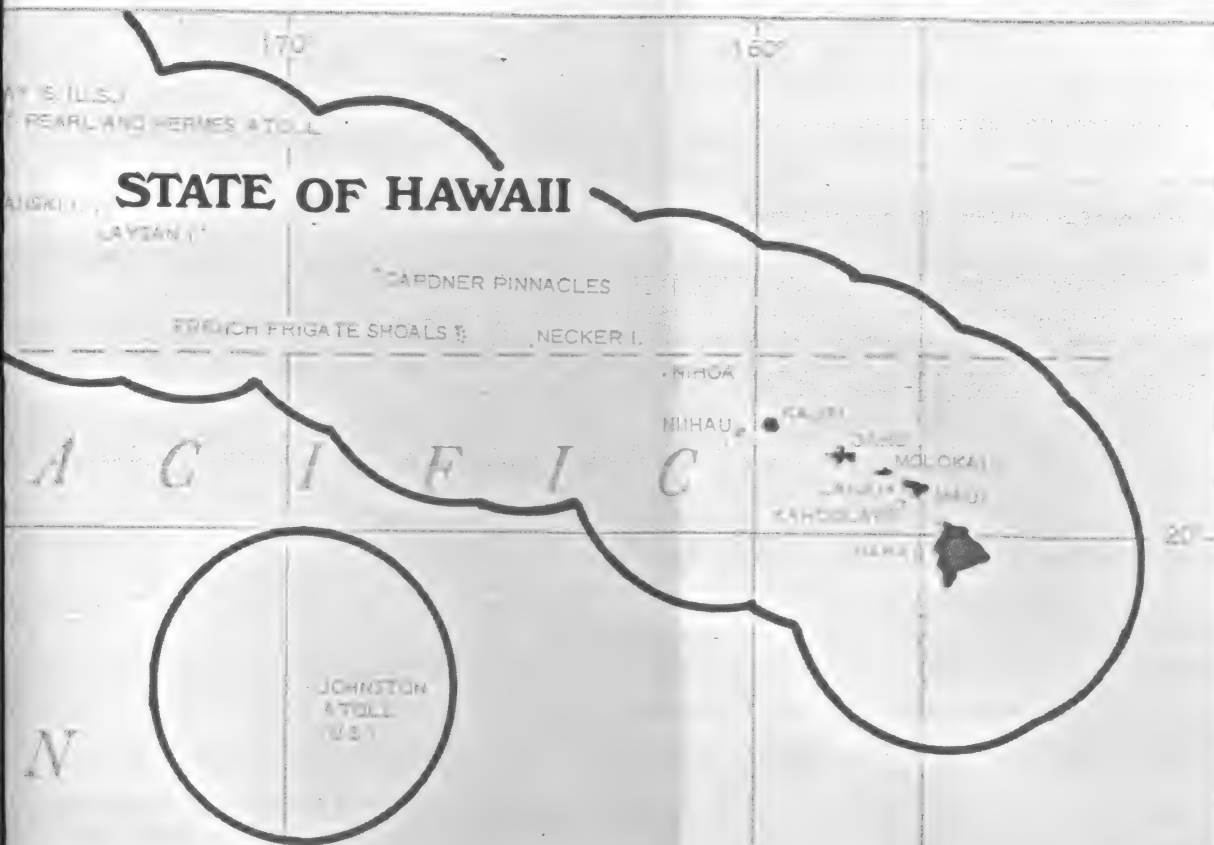
and

Pacific Basin Development Council

January, 1989



STATE OF HAWAII



PACIFIC ISLANDS: CAPITALS and POLITICAL STATUS

ENTITY	CAPITAL	POLITICAL STATUS
American Samoa	Pago Pago (Tutuila)	U.S. unorganized, unincorporated territory
Cook Islands	Avarua (Rarotonga)	Self-governing in free association with N.Z.
Federated States of Micronesia	Kolonia (Pohnpei)	Self-governing in free association with U.S.
Fiji	Suva (Viti Levu)	Independent state
French Polynesia	Papeete (Tahiti)	French overseas territory
Guam	Agaña	U.S. organized, unincorporated territory
Hawaii	Honolulu (Oahu)	U.S. state
Kiribati	Bairiki (Tarawa)	Independent republic
Nauru	Yaren	Independent republic
New Caledonia	Noumea (New Caledonia)	French overseas territory
Niue	Alofi	Self-governing in free association with N.Z.
Northern Mariana Islands	Saipan**	U.S. commonwealth
Papua New Guinea	Port Moresby	Independent state
Pitcairn Islands	Adamstown (Pitcairn I.)	British colony
Republic of Palau	Green Koror*	Trust Territory of the Pacific Islands
Republic of the Marshall Islands	Majuro	Independent state
Solomon Islands	Honiara (Guadalcanal)	Independent state
Tokelau	(Administered from Apia, Western Samoa)	New Zealand territory
Tonga	Nukunono (Tongatapu)	Independent kingdom
Tuvalu	Fongafale (Funafuti)	Independent state
Vanuatu	Port-Vila (Efate)	Independent republic
Wallis and Futuna	Mata-Utu (Uvea)**	French overseas territory
Western Samoa	Apia (Upolu)	Independent state

- * Status is as anticipated at the end of U.N. trusteeship
- ** Uvea (not named on map) is the main island of the Wallis Islands

THE PACIFIC BASIN DEVELOPMENT COUNCIL

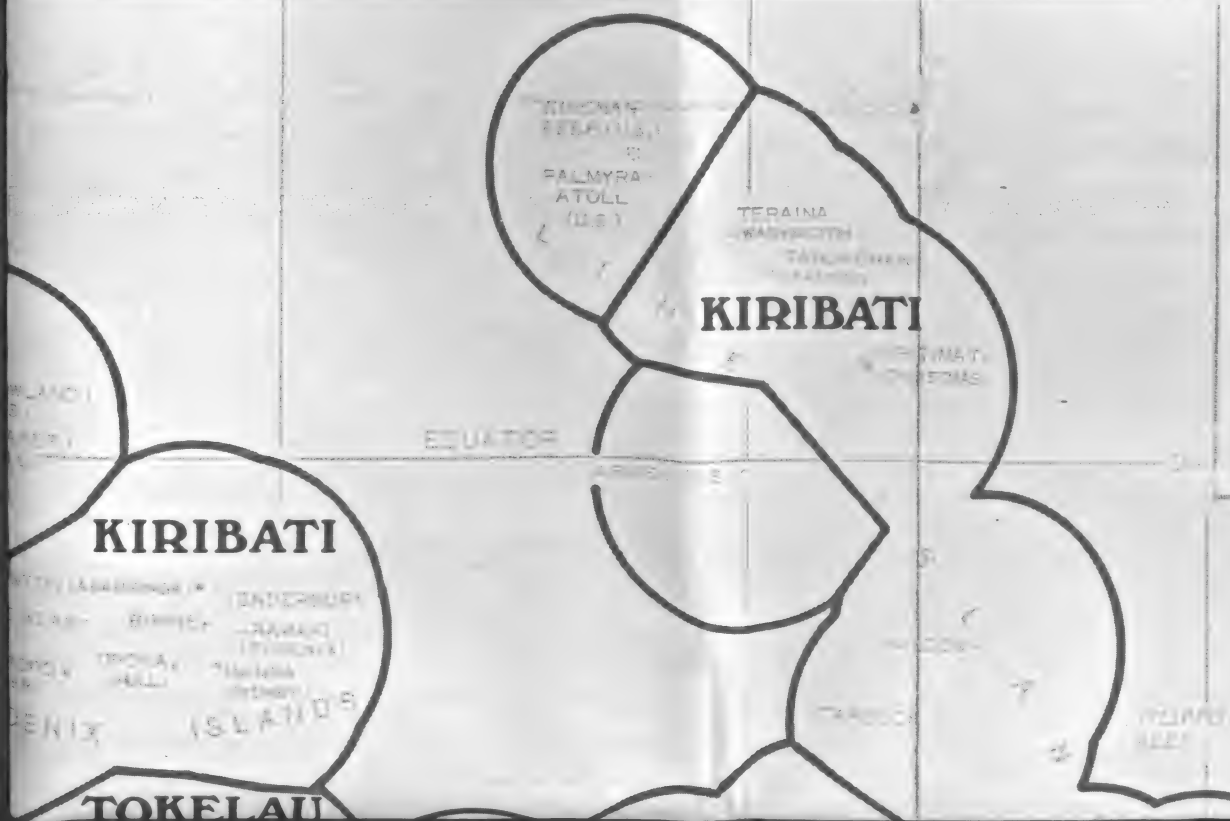
The Pacific Basin Development Council (PBDC) is a non-profit, educational, public organization and is incorporated under State of Hawaii laws and is headquartered in Honolulu. The PBDC was established in 1980 by the Governors of the Territories of American Samoa and Guam, the Commonwealth of the Northern Mariana Islands and the State of Hawaii. PBDC is, in effect, an extension of the Territorial, Commonwealth and State governments in the Pacific.

The office of President, Vice President, Secretary and Treasurer are held for one year and rotate among the member Governors.

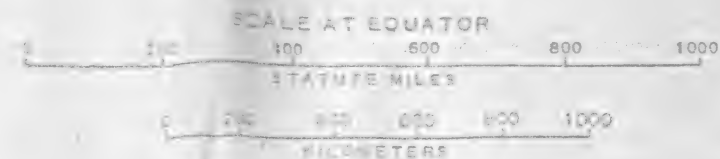
The PBDC addresses and articulates, through its Board of Directors, the economic and social development concerns of the Pacific Islands. The ultimate goals are job creation and maximum positive impact on the local island economies.

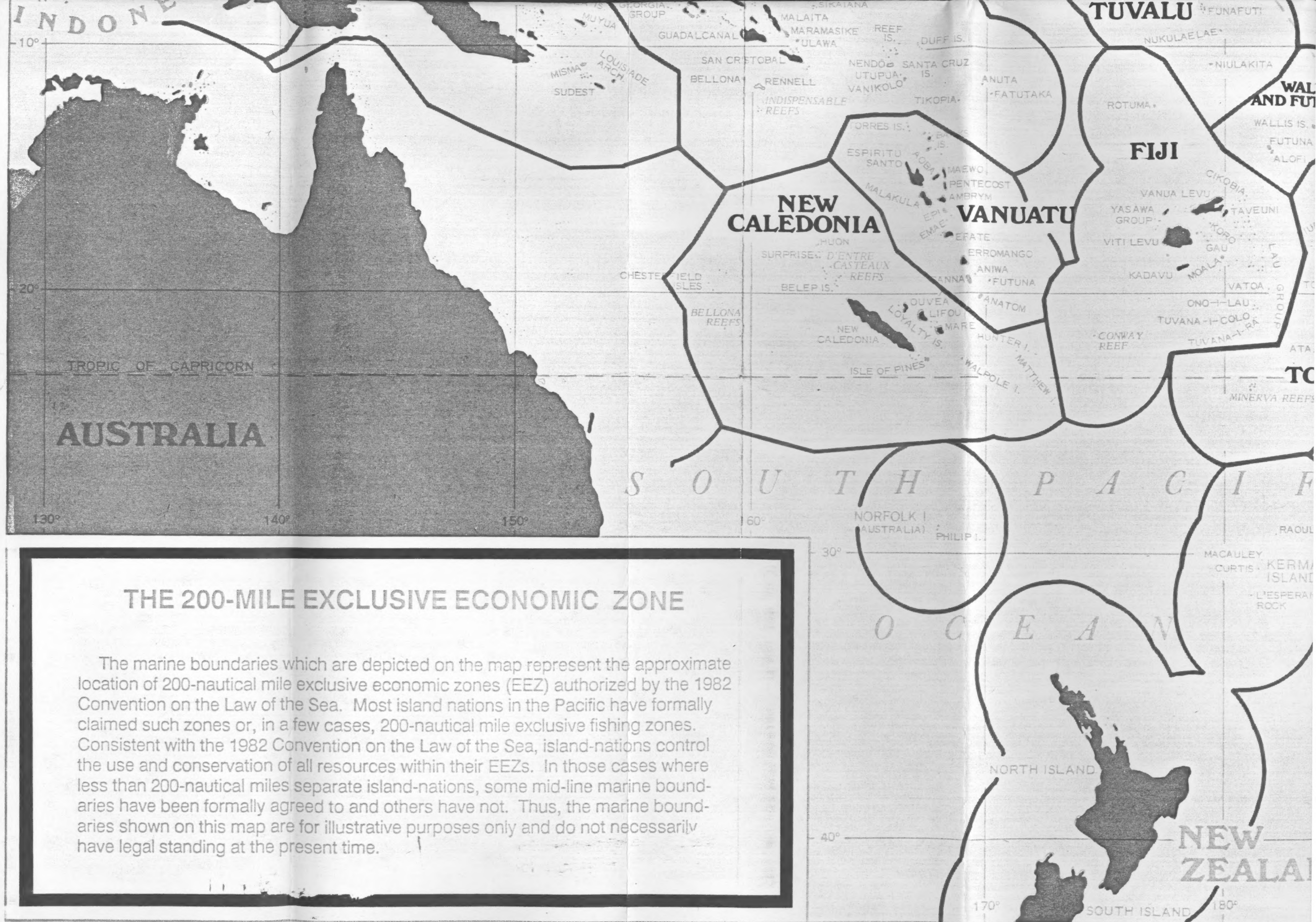
Governor Peter Tali Coleman, Territory of American Samoa
 Governor Joseph F. Ada, Territory of Guam
 Governor Pedro A. Tenorio, Commonwealth of the Northern Mariana Islands
 Governor John Waihee, State of Hawaii

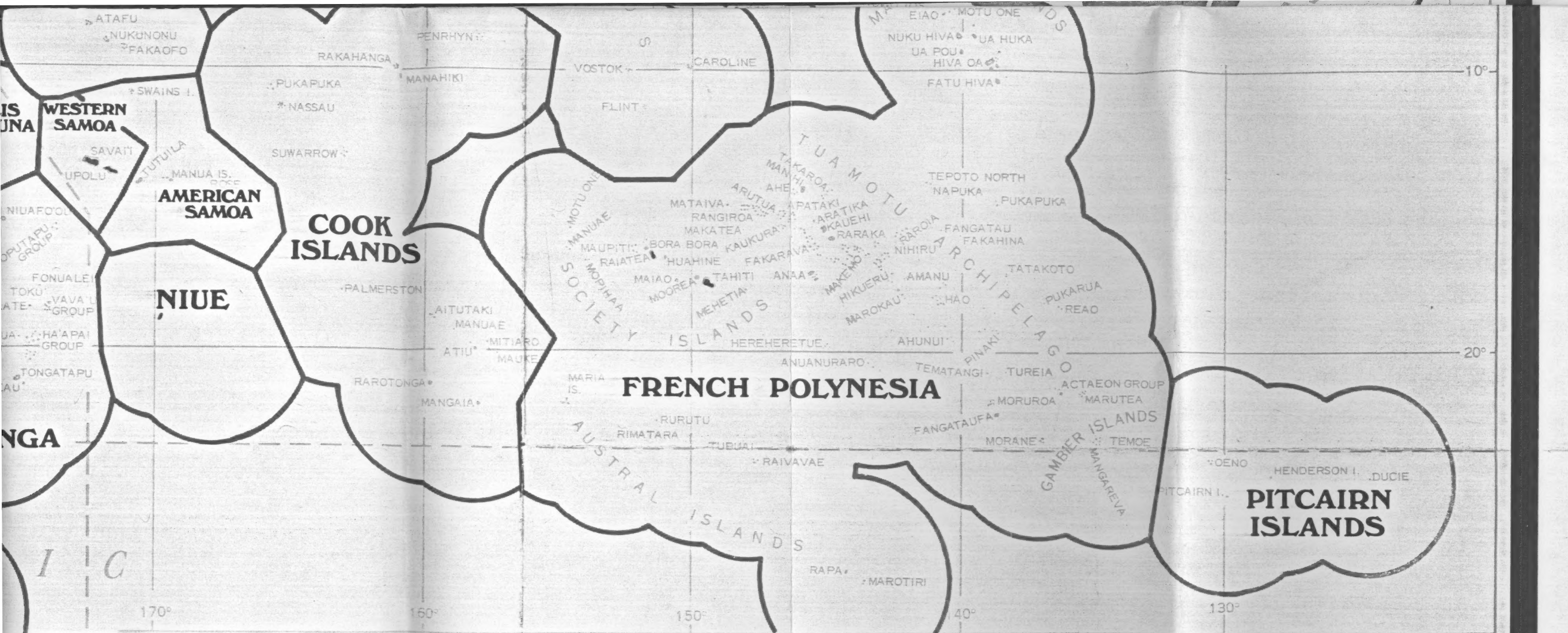
KIRIBATI



KIRIBATI







PACIFIC ISLAND NATIONS

and their

200 MILE EXCLUSIVE ECONOMIC ZONES

Published jointly by the
STATE OF HAWAII
 DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT
 and the
PACIFIC BASIN DEVELOPMENT COUNCIL

JANUARY 1989

APPLICATION for DXCC COUNTRY STATUS

for

JARVIS ISLAND

APPENDIX IX

News Article

Pacific Isles Trying to Solve Economic Zone Puzzle

by

Stu Glauberman
Star-Bulletin & Adviser

Honolulu, Hawaii

January 14, 1990

Pacific isles trying to solve economic zone puzzle

By Stu Glauberman
Advertiser Government Bureau

The slicing up of the South Pacific into exclusive national fishing and mining zones poses new and potentially frustrating problems for the Pacific islands.

The 1982 Convention on the Law of the Sea made it possible for the United States and other nations to claim 200-nautical-mile exclusive economic zones to control the use and conservation of the resources within them.

The zone surrounding Hawaii is one of a dozen proclaimed by President Reagan in March 1983.

Washington claimed sovereign rights and jurisdiction for exploring, conserving and managing resources 200 miles seaward from the East and West coasts, Puerto Rico, Alaska, Hawaii, American Samoa, Guam, Northern Marianas, Wake Island, Johnston Island, Palmyra Atoll, Jarvis Island and Howland Island.

The act increased the area under U.S. control by 170 percent and some 2 million square nautical miles.

Hawaii's land and sea area expanded to 634,000 square nautical miles — larger than the land areas of Texas, California, Oregon, Washington, Wyoming and Colorado combined.

One of the principal reasons for proclaiming the zones was to stake a federal claim to min-

eral deposits, including potentially valuable manganese nodules and cobalt crusts.

However, there is still no legislation spelling out how Washington is to manage its new ocean empire.

Federal fishery conservation and management laws and a law governing continental shelf lands are on the books but do not necessarily apply to the EEZs.

In the South Pacific, however, the meeting of EEZ boundaries is making relations between neighboring island peoples more complicated, according to Gov. Peter Coleman of American Samoa.

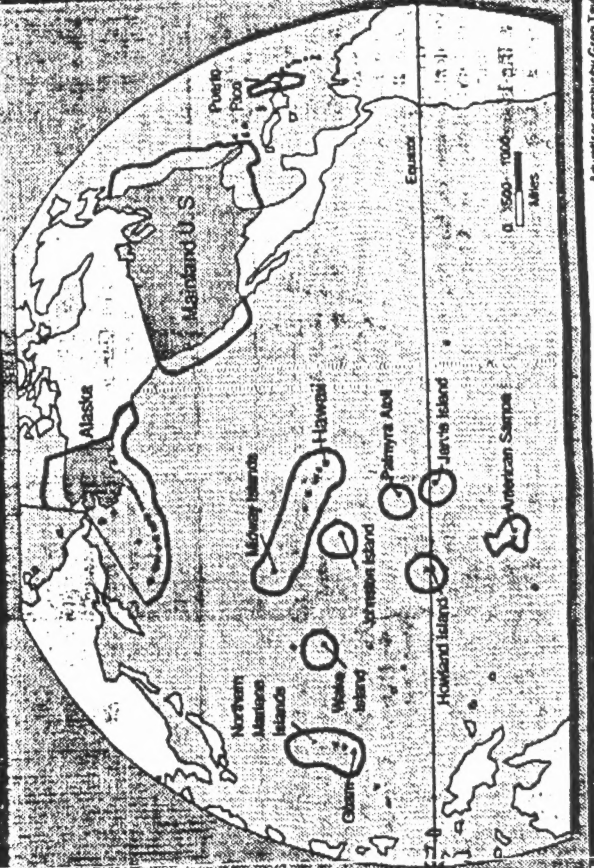
American Samoa is surrounded by the EEZs of self-governing island nations. Guam is sandwiched between the Federated States of Micronesia, which is foreign, and the Northern Marianas, an American commonwealth, which is, in turn, flush up against a Japanese EEZ.

Coleman says that despite the cultural ties that bind Pacific islanders, they cannot cooperate with their neighbors on matters of economic development without going through Washington.

To illustrate his point, Coleman asked the visiting congressmen to imagine that the states of North Carolina, Louisiana, Utah and Nevada were under U.S. jurisdiction, while the other contiguous states were independent and self-governing.

Exclusive economic zones

of the United States, Puerto Rico, Northern Mariana Islands and United States overseas possessions.



SOURCE: U.S. Geological Survey.

Advertiser graphics by Greg Taylor

"If my scenario were true, you could be sure that North Carolina, Louisiana, Utah and Nevada would want to deal directly with neighboring self-governing states in many matters," he said.

Unable to deal directly with their neighbors, the American flag islands are in a bind because the most pressing issues are often region-wide and

sometimes ocean-wide, and require a regional framework, he said. Coleman said the Western Pacific Fishery Management Council is an example of how a regional working group can blend federal, state, territorial and grass-roots expertise and responsibility.

Coleman said that while the geographical circumstances and political setting, he said,

are often region-wide and